

# The Iron Age

A Review of the Hardware, Iron and Metal Trades.

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## Walker's Single Direct-Acting Compound Steam Pump.

The subject of pumping water, oil and other fluids by steam-power is one of general interest. The amount of machinery for this purpose in a country like ours is enormous, and almost beyond estimation. If the statements of builders are reliable, and we see no reason for doubting them, not less than forty thousand steam pumps of different kinds are in use here, and the experience of the last twenty-five years has vastly improved their usefulness. Steam pumping machines appear somewhat in the following order, each succeeding year marking some improvement in convenience or economy:

- 1st. The heavy and expensive Cornish pumping engines for water works and mines.
- 2d. Pumps of many kinds driven by an independent steam engine, with fly-wheel, crank shaft, &c.
- 3d. Pumps and steam engines combined in one machine, with crank and fly-wheel.
- 4th. Duplex steam pumps, without crank or fly-wheel, wherein each of the engines works the steam valve of the other.
- 5th. Single direct-acting steam pumps, without fly-wheel or crank.
- 6th. Centrifugal pumps.
- 7th. Pumps, vacuum pumps, injectors, &c.
- 8th. Duplex compound steam pumps, similar in principle to the duplex above named, but possessing the advantages developed in the compound engine.

American inventive talent has been prolific in the production, making the names of Worthington, Blake, Cameron, Knowles, Selden and others, familiar as household words to persons interested in such matters. The latest addition to the lengthening list is the Walker single direct-acting compound steam pump, which is offered to the criticism of the mechanical world as to its economy of first cost, economy of fuel, simplicity, durability, and as a compound steam engine that has actually but two moving parts, i. e., the steam piston and the valve. The manner in which these desirable results are secured will be seen from an examination of the accompanying illustrations.

That this ingenious but simple mechanism may be readily understood, we add this brief description: The elongated piston has two ends provided with packing, and has a cylindrical portion of a lesser diameter extending between the said ends, the said portion being fitted to work steam-tight in a central partition in the cylinder; two annular chambers are thus formed into which steam is admitted to act upon the smaller areas of the piston ends, and it is afterward expanded into the spaces between the piston ends and the cylinder covers, to act upon the larger areas of the said piston. A double cylindrical valve regulates the movements of the steam, each half of it being formed with a passage to connect two ports through which steam passes from the annular space to the space between the piston and the cylinder head, and also with a passage which connects the larger steam space with the exhaust passage. Steam is admitted into a space between the two parts of this valve, and finds its way by suitable openings into the end spaces between the said valve ends and valve box covers; the said end spaces are connected by passages with ports formed in the aforementioned partition, and as the piston moves to and fro passages formed in the said piston establish a communication between the said ports and a port leading into the exhaust passage, thus relieving the valve from pressure on one end and causing it to be quickly pushed in that direction by the steam at the opposite end; the parts are all so arranged as to provide effectually for sufficient steam to cushion both the piston and valve so as to prevent striking under any circumstances.

This steam pump has been extensively introduced into Great Britain by leading manufacturers under license of the inventor, who resides there. It is manufactured and sold in this country by Messrs. E. & A. Betts, of Wilmington, Del.

**European Locomotives.**—There are German factories and plant sufficient to turn out 1850 to 1900 locomotives per annum, while the average consumption of them at home is only 500 to 600, the number ordered during the past twelve months, in fact, having been only 280. In 1873-3, the price of a good engine was varied from £3450 to £3600, while at present tenders are sent in as low as £1400, a price at which the builder estimated to lose £200. The engines built by Germany in excess of her requirements used to flow over into Russia, Austria, Switzerland, to a small extent into Italy, Sweden, Norway, and Denmark, but in the latter countries the competition of Alsatian and French makes is considerable. As to Russia, the new regulation, obliging railway companies to supply themselves to half their wants from works within the country, and removing privileges formerly enjoyed by importers, amounts to a virtual exclusion of foreign goods, German or other. The percentage of value levied in

different countries as an import duty on locomotives is as follows: Austria, 3-3 per cent.; Belgium, 1-3; Denmark, 2-3; France, 13-3; Holland, 1; Italy, 2-7; Russia, 6-1; Switzerland, 1-3.—*Iron.*

**Effect of Protection on the Manufacture of Steel Rails.**—The following memorial to Congress, signed by more than 90 officers and managers of leading railroads in all parts of the country, was presented in 1870: "Immediately before the construction of the first steel rail manufactory in this country foreign makers charged \$150 per ton (equal then

sively upon the foreign supply, and therefore join in asking that, instead of the present *ad valorem* duty, a specific duty of two cents per pound be placed upon this article." The duty was fixed at \$28 per ton, gold, and to-day Bessemer steel rails of best quality can be bought at American mills at \$55 currency. Domestic competition, induced by protective duties, has given to American railways cheaper steel rails than English manufacturers, without this competition, would ever have given them. For more than a year foreign steel rails have almost ceased to come into this country, yet in that time American rails have fallen in price

principles to the same industry. But there is ample work yet to be done. The fuel consumed in the manufacture of iron, as, indeed, in every furnace where coal is used, is greatly in excess of what theory indicates; and the clouds of smoke which darken the atmosphere of our manufacturing towns, and even of whole districts of country, are a clear indication of the waste, but only a small portion of the waste, arising from imperfect combustion. The depressing effect of this atmosphere upon the working population can scarcely be overrated. Their pale, I had almost said etiolated, faces, are a sure indication of the absence of the vivi-

flues of large dimensions, terminating in lofty chimneys on a hillside or distant plain. A system of this kind has long been employed in the mercurial mines of Idria, and in other smelting works where noxious vapors are disengaged. With a little care in the arrangements the smoke would be wholly deposited as fine-dust or soot in the horizontal galleries, and would be available for the use of the agriculturist.

## Calculating the Power of Belting.

A writer in the *Textile Manufacturer* gives the following, which will interest mechanics: As the power of a steam engine is expressed in three different ways—nominal, indicated and actual—so ability for a belt to transmit power may be expressed in three corresponding methods. We may denote, first, the possible power, that is, the power which it is possible for the belt to transmit under the very best conditions. The power which it is possible for a belt to transmit is simply on the strength of the belt and the peripheral velocity of the driving pulley. In taking power from any source of motion, these are the two points which control us; all the others we can control and modify to a certain extent. Moreover, we can determine these data with a considerable approach to accuracy, while all the others demand very difficult and careful special experiment. Seeing, then, that ordinary belts will, as we have stated in a previous article, sustain safely a working tension of 45 pounds per inch in width, the rule to determine the width of belt and size of pulley required to transmit a given horse power is easily found. Since a horse-power is 33,000 pounds raised one foot high per minute, we must adjust the width and velocity of belt so as to effect the required result. Thus, if the belt moves with a velocity of 733 feet per minute, a belt five inches wide will transmit five horse-power, provided the effective tension is 45 pounds per inch. If the velocity be increased to 1466 feet per minute, the same belt with the same tension will transmit ten horse-power. So that a five inch belt applied to a pulley four feet in diameter, making 120 revolutions per minute, would transmit ten horse-power when the effective tension is 225 pounds. We say effective tension, meaning thereby the tension actually applied to produce the revolution of the receiving pulley.

A belt may be subjected to great tension, and yet a very little of this tension may be applied to the transmission of power. But this circumstance can only arise when very little resistance is offered by the receiving pulley. If the latter offers an adequate resistance the power will be transmitted. Consequently, the rule that we have indicated corresponds to the rule for determining the nominal horse-power of a steam engine; the engine may work up to the power assigned to it, and indeed may in general far exceed this power, just as the belt may transmit the power for which it is calculated, though there is no certainty that it does so. By taking the actual effective tension of the belt and multiplying it by the actual velocity, we get what may be called the indicated power of the belt which corresponds to the indicated power of the steam engine. And, finally, by measuring the actual power transmitted—which may be done by means of a dynamometer—we can get the actual power transmitted. Rules based upon the amount of belt surfaced in contact with the pulley, and on similar data, cannot be made to give reliable results. For practical purposes velocity and power to resist tension are the only available elements of the calculation. Actual tension, adhesion, friction, etc., can all be varied at will, and consequently form no certain dependence for the calculations of the machinist and engineer.

A large and very rich deposit of copper ore has lately been discovered in the southwest arm of Notre Dame Bay, Newfoundland, at no great distance from Bett's cove mine. The vein has been traced for one hundred and forty feet, and widens as it descends. The samples taken from it contain 12 per cent. of pure copper. Mining operations will be commenced at once, as there is no want of capital. Another valuable deposit is also reported to have been found at Rogue's Harbor, and a lead mine in Fortune Bay. These and subsequent discoveries give every indication that Newfoundland is destined to take a prominent place among the mining regions on this side of the Atlantic. An important fact is that all these discoveries have been made along the shore, the interior being yet untouched. It is expected that not less than \$800,000 worth of copper ore will be exported this year. Labor is in great demand in the mining region, and many fishermen of late are abandoning the oar, the shore fishery being unsuccessful, and applying for employment at the mines.

The *Philadelphia Ledger* says: There is a paper church near Berlin which can contain nearly 1000 persons. It is circular within, octagonal without. The reliefs outside and statues within, the roof, ceiling, the Corinthian capitals, are all papier mache, rendered water-proof by saturating in vitriol, lime water, whey and white of eggs.

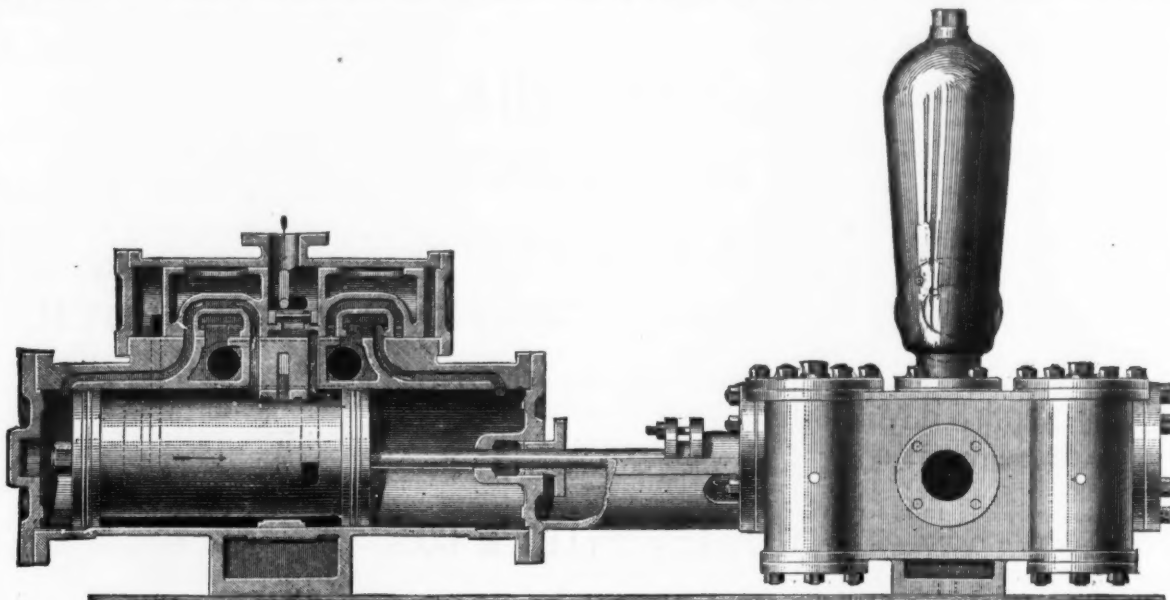


Fig. 1.—Vertical Section of Cylinder and Steam Chest.

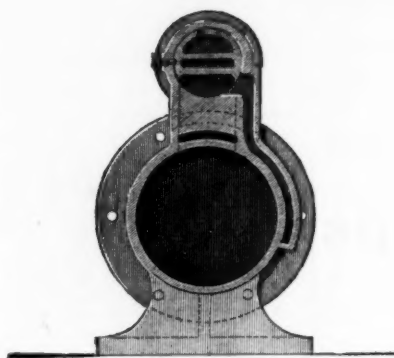


Fig. 2.—Section of Cylinder and Valve.

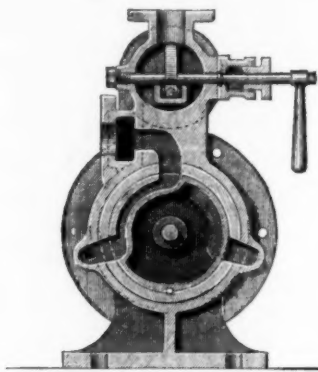


Fig. 3.—Section of Cylinder, Steam Chest and Piston.

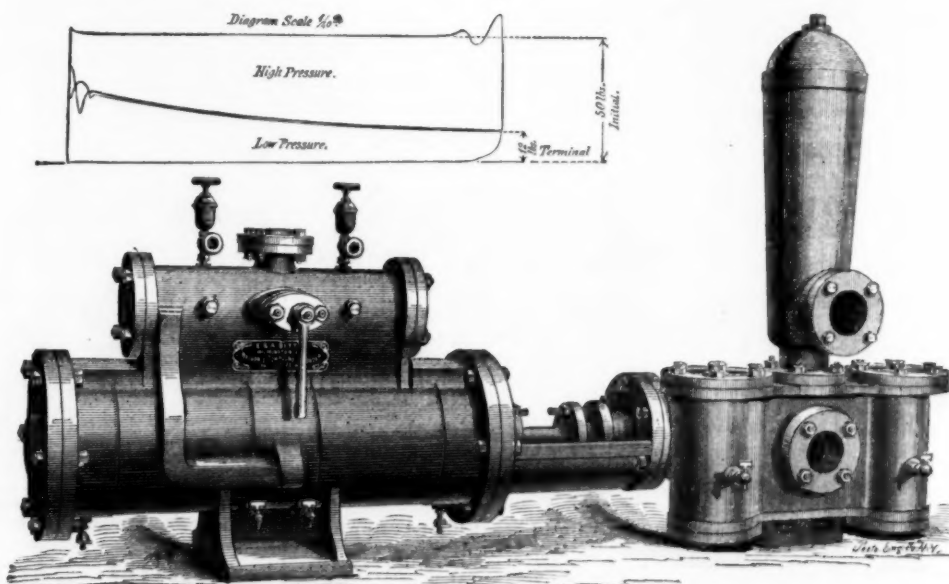
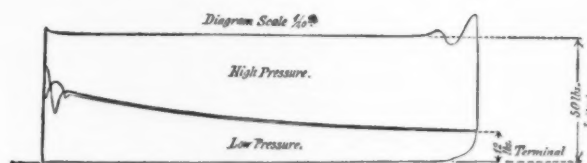


Fig. 4.—Perspective View of Pump.

WALKER'S PATENT COMPOUND STEAM PUMP.

to \$225 currency) for steel rails. As American works were built, foreign skilled labor introduced, home labor instructed, and domestic irons, clays, ganister and spiegel (after many and expensive trials) found to produce excellent rails, the price of the foreign article was gradually lowered until it now stands at less than \$79 per ton in gold, or \$96-98 currency. Now that several millions of dollars have been expended in machinery, furnaces and experiments in perfecting the process of manufacture in this country, and numbers of our own citizens are dependent upon it for support, the business is threatened with annihilation by the pressure of English and Prussian makers. We, as users of steel rails, and transporters of the food and material for American manufacturers and their numerous employees and skilled laborers, do not desire to be dependent exclu-

sively upon the foreign supply, and therefore join in asking that, instead of the present *ad valorem* duty, a specific duty of two cents per pound be placed upon this article." The duty was fixed at \$28 per ton, gold, and to-day Bessemer steel rails of best quality can be bought at American mills at \$55 currency. Domestic competition, induced by protective duties, has given to American railways cheaper steel rails than English manufacturers, without this competition, would ever have given them. For more than a year foreign steel rails have almost ceased to come into this country, yet in that time American rails have fallen in price

\$20 a ton, solely as the result of home competition.—*Railway Age.*

## Atmospheric Oxygen for Industrial Uses.

The address at the opening of the British Science Association was made by the President, Dr. Andrews, and was very able. Among many other things he said: In the application of science to the useful purposes of life, chemistry and mechanics have run an honorable race. It was in the valley of the Clyde that the chief industry of this country received, within the memory of many here present, an extraordinary impulse from the application by Neilson of the hot-blast to the smelting of iron. The Bessemer steel process and the regenerative furnace of Siemens are later applications of high scientific

ifying influence of the solar rays, so essential to the maintenance of vigorous health. The chemist can furnish a simple test of this state of the atmosphere in the absence of ozone, the active form of oxygen, from the air of our large towns. At some future day the efforts of science to isolate, by a cheap and available process, the oxygen of the air for industrial purposes may be rewarded with success. The effect of such a discovery would be to reduce the consumption of fuel to a fractional part of its present amount; and although the carbonic acid would remain, the smoke and carbolic oxide would disappear. But an abundant supply of pure oxygen is not now within our reach, and in the meantime may I venture to suggest that in many localities the waste products of the furnace might be carried off to a distance from the busy human hive by a few horizontal



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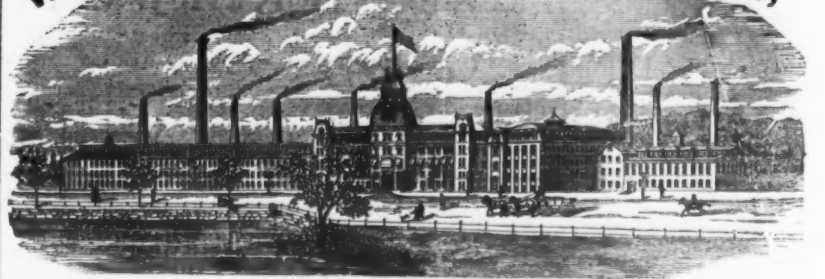
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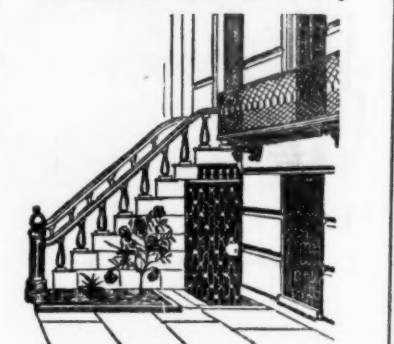


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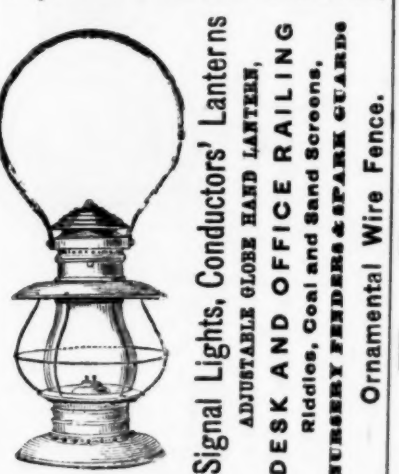
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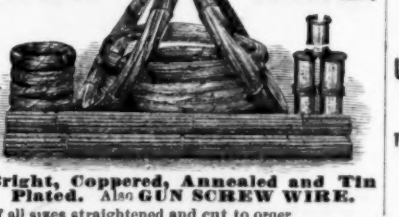
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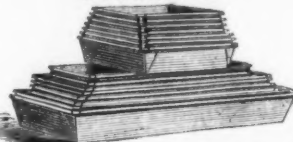
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All warranted the Best Solid Cast Steel.

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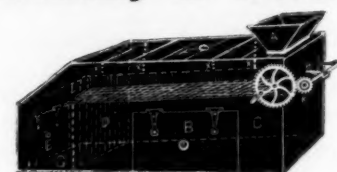
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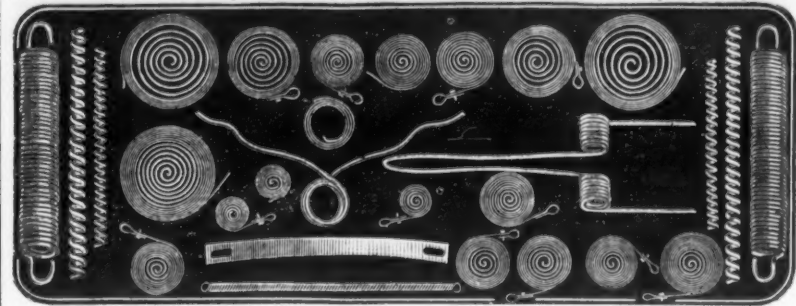
In offering this machine to the public, we would state that no fear need be entertained as to its durability, great care having been taken in the manufacture. The wood used is of the best quality of matched pine, and made in such manner as to prevent any dust from escaping when the sieve is being worked. The cog-wheel Ash-Sifter should be used by all having the care of Boilers, Furnaces, &c., and are likely to supplant all others. We claim it will do the work of any five machines now in use. It is always ready: can be worked backward and forward. Ashes to be sifted are placed in the Hopper on top of the Sieve, which we will designate as A. The weight of the ashes opens a trap door under the Hopper and enters the Sieve, which is suspended on an angle by double-jointed hooks. A K is a large cog-wheel fastened on the side of Sifter, and connects with one one-fourth its size, which is secured on a crank shaft, and connects an arm with the Sieve. B, Ash-box door; C, Ash-box; D, partition that separates the coal from the ashes; E, the coal-bin door; G, coal-bin. L is the opening where the coal slides into the bin while being sifted; F, door on top to take out clinkers, &c. With one revolution of the cog-wheel K, we set from ten to fourteen motions of the Sieve. We make three sizes: No. 1, three and a half feet long, two feet six inches high, and twenty inches wide, price, \$35; No. 2, four feet long, thirty-three inches high, and two feet wide, price, \$30; No. 3, four and a half feet long, three feet high, and two feet wide, hopper to hold one-half barrel, set it up in less than one minute, price, \$35. References can be had upon application to parties now using the sifter. All Sieves warranted to give satisfaction.

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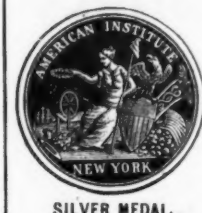
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It is also for sale in 1, 5 and 10 lb. packages by Hardware Dealers generally throughout the country.

## PERFECT COMBUSTION BY AN OXYGEN BLAST.

By this process oxygen is imparted to the blast simply by its passage, on its way to the place of combustion, through a chamber or vessel holding an oxygen compound, from which, by the agitation of the air thereon, oxygen is set free and thus imparted to the blast. The required volume of this blast is one-half less. The combustion becomes perfect therefrom, all the carbon in the fuel being converted into a high and concentrated heat, without smoke or gas, but that of carbonic acid, being formed. Beside a saving of fuel, obtainable in all cases by this blast, advantages arise from it varying according to the appliance of the heat. —On Forge Fires it gives a clean and intense heat, free from all sulphurous gas, whereby a better and quicker welding is had and time saved. On fires under boilers for making steam, the saving in fuel is 25 per cent. and over, the working capacity can be increased in same ratio by reason of the intensified and accelerated combustion, which latter also overcomes the disadvantages connected with the use of fine dust and impure coal. Castings from a cupola in which the fire is sustained by this blast become of superior quality, uniformly soft to work and very tough, resembling wrought iron and steel; they forge hot and cold to some extent; the iron becomes strengthened and purified, being freed from carbon and sulphur. For blast furnaces this process becomes of vast importance—it saves fuel, increases the working capacity, perfects and reduces the cost of the metal, makes sulphurous and other impurities fit for use. The serious drawbacks arising from imperfect combustion, caused mainly by otherwise uncontrollable atmospheric influences, are overcome. The work of a puddling furnace and that of decarburizing the iron, both for wrought iron and steel purposes generally, is much simplified, shortened and perfected as to purity of product; the work of so many hours is reduced to as many minutes by this process. The process has the merit of being simple and easily applied, and with but very little expense, and this only for the needed chamber or vessel and its connection with the blast pipe; the vessel may be a wooden keg, barrel or larger cask or tank, properly lined, from two gallons for a single forge fire up to 500 gallons and over, according to the blast in use. The cost of the oxygen is conditioned by, and made subject to, its effect—it is but a small item compared to the gain from it. Although this process has been in practical use for over a year, the inventor felt reluctant to offer it to the public before having its utility and practicability fully established, beyond any and all contingencies, not from a theoretical standpoint, but from the testimony of manufacturers who have used the process this last year, and whose standing and reputation as manufacturers are of the highest order, and such as to entitle them to the consideration of others. For further information, and for small specimens of castings from this process, address

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## Iron and Coal Poetry.

The late Professor Rankine was eminent in physical science, and was a very pleasant gentleman, but he was never known during his lifetime as a song writer. A volume of his verses is about to be published, however, and the following are given to the public as specimens. If they are fair specimens, we do not think they will add much to Prof. Rankine's posthumous reputation:

### IRON.

Myriads of ages ere this earth  
Beheld the first of human birth,  
When o'er the future Britain rolled  
The monster-teeming Ocean old,  
Deep in the bosom of this land  
Heaven sowed the seed with bounteous hand,  
Whence Britain's strength and glory spring,  
Iron, the Metals' mighty king.

We envy not those distant lands  
Whose rivers roll o'er golden sands;  
Rich in the nobler metal we,  
That guides the ship o'er trackless seas—  
That digs the mine—that tills the plain—  
That bears and drives the flying train—  
That wealth in every shape bestows,  
And arms our hands against our foes.

Yet not in lifeless ore alone  
Does Britain Iron's virtues own.  
Man nor the elements can foil  
The children of the Iron soil.  
'Tis theirs to wield resistless might,  
Danger, and toil, and death to slight,  
In every clime between the poles,  
With Iron frames and Iron souls.

### WHAT SHALL WE DO FOR COAL?

With furnace fierce in forge and mill,  
And steamships on the foam,  
And trains that sweep through vale and hill,  
And roaring fires at home,  
In warmth and wealth while we rejoice,  
Nor heed the risk we run.  
Geology, with warning voice,  
Says, "Coal will soon be done:  
Then forge and mill must all stand still,  
And trains no longer roll,  
Nor longer float the swift steamboat;  
Oh! what shall we do for Coal?"

For countless ages forests dark  
Grew thick o'er Britain's Isle;  
For countless ages wood and bark  
Lay deep beneath her soil.  
The old black diamond may appear  
As though 'twould ne'er give o'er;  
But seventy million tons a year  
Will soon exhaust the store:  
Then forge and mill must all stand still,  
And trains no longer roll,  
Nor longer float the swift steamboat;  
Oh! what shall we do for Coal?"

Our goods by horse and cart must go,  
By coach and four the mail;  
Our travelers walk, swim, ride, or row,  
And steam give place to rail;  
From wind and water we must try  
To draw what help we can,  
While sticks and straw our clothes must dry,  
And boil the pot and pan;  
And forge and mill must all stand still,  
And trains no longer roll,  
Nor longer float the swift steamboat;  
Oh! what shall we do for Coal?"

If Britain's hopes on Coal depend,  
Her race is well nigh run;  
Decline and fall her realm attend,  
As soon as Coal is done:  
Yet Britain flourished long before  
Her treasures black were found;  
And worth and valor, as of yore,  
Against wealth may hold their ground.  
Though forge and mill should all stand still  
Cheer up, each valiant soul!  
While Britain can breed British Man,  
We never need care for Coal!

### The Base-Burner Litigation.

The following is the decision of Acting Commissioner of Patents, Doolittle, in the important interference case of Carter & Dwyer vs. Perry & Dickey. The suit, which is one of great interest to the stove trade, seems no nearer a final settlement than when it began:  
Dwyer and Carter vs. Dickey and Perry.—  
Interference.

[Appeal from the decision of the Board of Examiners-in-Chief in the matter of the interference between the applications of James Dwyer and John V. B. Carter, filed May 23, 1874, and Andrew Dickey and John S. Perry, filed April 24, 1874, for Letters Patent for "IMPROVEMENTS IN BASE-BURNING STOVES."—Decided October 3, 1876.]

A joint invention cannot be carried back to a date earlier than that at which the subject-matter was first discussed by the parties. Joint inventors can derive no benefits from individual efforts and proceedings occurring prior to the time that they came together for mutual operations, as priority cannot be awarded to joint inventors for that which was invented by one only.

Not until the ideas of the parties are incorporated in complete form is their joint invention accomplished. It appearing both as a presumption of law and from the evidence adduced that the successful party in the interference had knowledge of certain patents alleged to anticipate the claims involved, the case was remanded to the Primary Examiner for further consideration upon its merits.

Doolittle, Acting Commissioner:  
The subject matter involved in the above named interference is comprised in the first and third claims in each of the interfering applications.

The first and third claims of the later applicants, Carter and Dwyer, are as follows:

1. In a diving fire heating stove, the combination of the ascending and descending flues, located in the rear thereof, with the space between the grate and fire-pot, and the illuminating windows opposite the same, substantially as described.  
3. The combination of the horizontally vibrating and dumping grate J with the ring I, supported by the braces K, as shown and set forth.

The corresponding claims of Perry and Dickey are substantially the same as those of their opponents. Carter and Dwyer, however, in view of the fact that both the Examiner of Interferences and the Board of Examiners-in-Chief have decided that Perry and Dickey were the first to conceive, complete, and put in use the subject matter of the third claim; and, also, as they contend, the precise invention therein set forth is shown in the patent of Elihu Smith, of June 4, 1872, and claimed in the reissue of that patent, 6891, announce their purpose to no longer contest the subject matter of that claim in this proceeding.

As to the novelty of the matter of the claim in question, as well as to that of the first claim, it was decided by the Commissioner, June 29, on the hearing of a motion by Carter and Dwyer to dissolve the interference on the ground of lack of patentability, that the determination of this question would be postponed until after the final hearing and decision upon the question of priority, and that then the patent to the successful party should be withheld until the question of novelty could be reviewed and re-determined in the usual way as an *ex parte* question by the primary examiner.

The burden of proof rests upon Carter and Dwyer. They base their claim as prior inventors upon certain drawings and sketches made by Carter in 1867 and 1872. The attorney for Carter and Dwyer admits that the drawings of 1867 do not show the entire invention in controversy, as it does not embrace the anti-clinker idea; but those made in 1872 do show all the elements of the "Crown Jewel," the name given by these parties to the stove in controversy, and that each of them exhibits the elements embraced in the first claim, namely, rear reversible flues, a space between the bottom of the fire-pot and the top of the grate, and the illuminating windows opposite the space. It appears, then, that in resting their whole case upon the drawings and sketches of Carter, it would of necessity eliminate Dwyer from the contest. But this whole question as to the respective parties herein being joint inventors was passed upon by the Acting Commissioner, September 20, 1875. (8 Official Gazette 518.) The then Examiner of Interferences had dissolved this interference on the ground that neither Carter and Dwyer on the one hand nor Perry and Dickey on the other could properly apply as joint inventors of the devices claimed in the first and third clauses of their respective applications. The whole matter was elaborately gone into by the Acting Commissioner, and he decided that in view of the evidence and the joint oaths of the respective parties, their joint applications had been properly made. This decision proceeded upon the ground that the elements under discussion constituted a unit, and that the result produced was the union of the combinations claimed in the two clauses of claim, which in each case was a joint production. Upon a careful consideration of that decision, in view of the facts, I see no reason for disturbing it.

To now admit what is contended for by Carter and Dwyer, that Carter was the first to invent, would necessitate the dissolution of the interference. It is impossible to award priority to joint inventors for that which was invented by one only. Carter and Dwyer in their testimony both admit that the invention in its present shape was not completed or perfected until by their joint efforts they devised and constructed the stove in its present condition.

It appears that Carter in 1872, several years after it is alleged he had made his original sketches showing the elements of the first claim in controversy, first spoke to Dwyer about the matter; and it was not until November or December, 1873, that the Detroit Stove Works, of which Dwyer was a member, concluded to accept the ideas of Carter, and decided to construct a stove with his improvements. In January, 1874, Carter testifies that he commenced making working drawings and patterns of a stove, which were submitted to Dwyer, and the work went on under the latter's directions. This work was upon the stove known as the "Crown Jewel" comprising the entire matter in interference. It was during the construction of this stove that Dwyer gave directions to Carter to incorporate therein the particular form of grate with slots or followers, which is embraced by the present second claim, and which is alleged to be the invention of Dwyer. It was not until the ideas of the parties were thus incorporated into this stove that their joint invention was accomplished, and this occurred in the early part of 1874.

On the part of Perry and Dickey they allege, and I think it appears, that the invention, regarded as a whole, was devised and completed by their united efforts, and put in operation in this completed form as early as April, 1873. This was at a time anterior to the completion of the invention by Carter and Dwyer, to their joint action in the matter and to the acceptance of Carter's improvements by Dwyer or his company. Both tribunals below agreed upon this statement of the facts, and I have examined the evidence sufficiently to convince myself that they were correct.

The decision of the Board of Examiners-in-Chief in awarding priority to Perry and Dickey is therefore affirmed.

In remanding the application of Perry and Dickey, as above indicated, to the Primary Examiner for re-examination as to the matter of novelty, his attention is called to the fact that, both by presumption of law and by the evidence adduced in this proceeding, the respective joint parties were aware of the existence of the patents of James Spear and Elihu Smith at the time of the alleged completion by them of this invention. It is principally upon the patents of Spear and Smith, referred to in the brief of the counsel for Carter and Dwyer, that the motion to refer the case to the Examiner was based.

The case is now remanded to the Primary Examiner for consideration of those references in pursuance with the Commissioner's decision of June 29, above referred to.

**Fish on Foot.—Fish Skin Leather.**—The *Commercial Bulletin* has the following: "Shoes have lately been manufactured in Gloucester, Mass., from the skin of the cusk. They are said to be strong and give evidence of durability. If the new material for shoes proves what it promises it will open up a new market for fish skins which will no doubt be highly profitable. A patent has been applied for. The cusk belongs to the cod family; and we see no reason why the skins of a large number of useless fish that are now swimming about doing nothing may not be so utilized. They would be glad of the chance."



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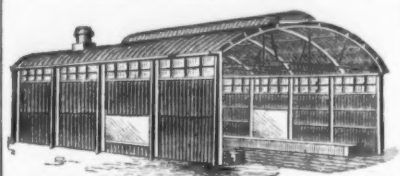
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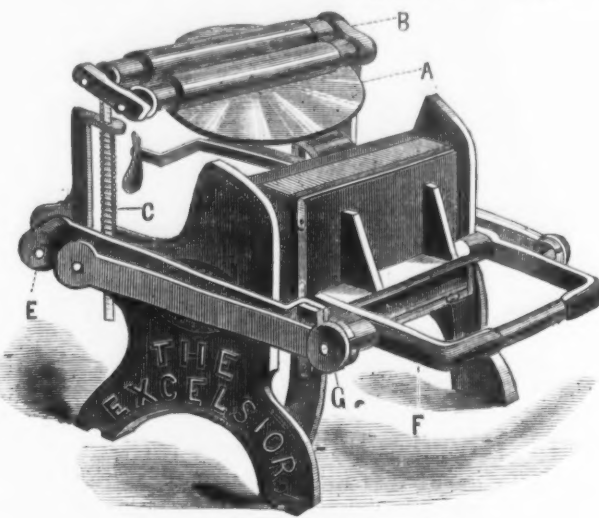
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Bands, Scrolls, Horse Shoe Bars, Nut and  
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Manufacturer of**Caulking Irons,**  
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## Excelsior Printing Press.

There seems to be no trade or branch of busi-  
ness to which the American takes so readily,  
and none which he employs so extensively, as  
that of printing. Type foundries and press  
manufacturers have found an abundant market  
for their productions, and have been very ready  
to fill all possible wants in this direction.  
Small presses suitable for amateurs and those  
having only a limited amount of work to do  
have become a necessity and there is a large  
market for them. We illustrate herewith two  
styles of the Excelsior press, especially in-  
tended for the use of amateurs, boys, business  
men who have numerous small jobs, or, in fact,  
anyone who wishes to do small jobs of print-  
ing.

THE EXCELSIOR PRINTING PRESS.—Fig. 1.

Fig. 1 represents one of these presses with  
self-inking arrangement. This press is made of  
various sizes, the smallest having a chase 3½ x  
5½ inches, and the largest 7x11 inches. In the  
figure A is the ink table, which is a rotary one,  
as in the larger job presses. The rollers, B, are  
carried across the ink table by the roller  
carriage C, which is operated by the connecting  
bar E. The latter is hinged to the platen, and  
as the impressions are made with the hand on  
the lever, F, in connection with the side arms,  
G, the swinging platen works the connecting  
bar; when the lever is raised and the platen  
drawn back, the rollers pass down completely  
over the form, and back again when the impres-  
sion is put on. A simple device rotates the ink  
table at each impression that the rollers may  
distribute the ink thoroughly. Self acting grip-  
ping fingers hold sheets in place and remove  
them from the type when printed.This press is capable of great speed. It is,  
in this respect, limited only by the skill and speed  
of the operator in feeding and handling the  
press. It is said that from 1000 to 2000 im-  
pressions per hour can be made with it. This,  
we know, requires an exceptionally good press-  
man; but still it can be done. These presses  
are quite moderate in price, and are capable of  
doing very good work.machine shops, and is capable of giving about  
one hundred blows per minute, and the force  
of each blow can be graduated from one to one  
thousand pounds pressure on the surface cor-  
responding to the diameter of the striking sur-  
face of the rammer. An ordinary road engine  
has affixed to its rear a crane, which is mov-  
able right or left, and at the end of this crane  
is the hammer, the cylinder through which the  
latter moves being connected with the boiler of  
the engine by means of gutta percha hose.  
Attached to the cylinder mentioned is a steam  
escape valve, by means of which the work of  
the hammer can be regulated, either slow or  
fast, or the blows hard or soft, at the will of  
the man having charge of the valve. The engine  
can, of course, be moved or stopped, to the will  
of the engineer, and sent in any direction. Anordinary square of Belgian block or rubble  
pavement, no matter how rough or uneven it  
may be, can be levelled in about ten hours by  
this road hammer.

## Thick Coal Seams.

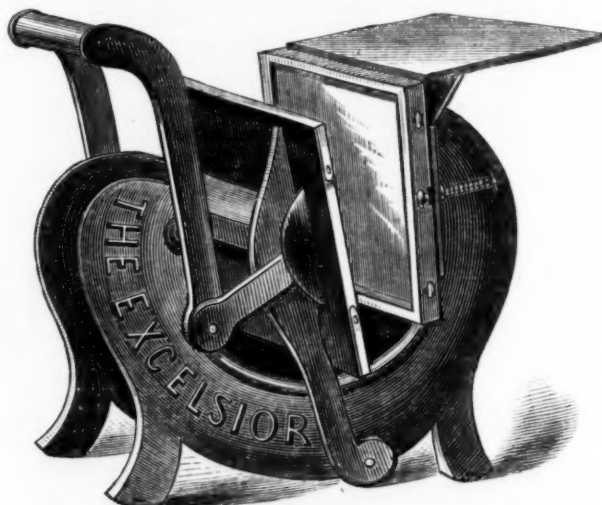
It appears that in some parts of Europe there  
are seams of coal far thicker than those  
found in any part of Great Britain. The Ten-  
yard coal of South Staffordshire has been sup-  
posed to be nearly as thick as any known.  
The London Mining Journal says this is a mis-  
take. In the southwestern part of Poland  
there is a bed 16 yards thick, which is probably  
the thickest bed of mineral fuel in Europe,  
being worked from the outcrop in mines near  
the village of Domtrowa, but giving only 50:38  
of carbon. In Moravia, where some of the pits  
are worked by Baron Rothschild, there is one  
seam (the Adolph-Flötz) 25 ft. in thickness,  
and is included in the upper carboniferous  
series. But all these are greatly exceeded by  
some of the Bohemian collieries according to  
the report sent to the members of the Northern  
Bohemian Collieries Company. It is written by  
Mr. J. W. Lukis, managing director of Powell's  
Lamtwit Collieries, and who before joining the  
Northern Bohemian Company visited the

Fig. 2.

In figure 2 we have the Excelsior press without  
the self-inking arrangements. The five sizes vary  
from 2½x3½ inch chase up to 10½x15½ inch  
chase. All these presses, except the smallest  
size, are arranged so that they may be worked  
by a treadle, as well as by the hand. The treadle  
in this case is a decided advantage, as it leaves  
the hands free, the one for inking and the other  
for feeding the press. The ink table is remov-  
able, and the whole press is portable and easily  
set up on a table or bench. The various adjust-  
ments of these presses are quickly made and  
readily learned. The manufacturers are Messrs.  
W. A. Kelsey & Co., Meriden, Conn. In ad-  
dition to the presses this firm deal in all kinds  
of printers' supplies, type, outfits for offices,  
and other material necessary for use with small  
presses.This latter is a great convenience as it enables  
one to purchase just what is wanted and no  
more. In regard to the present rage for printing,  
a recent writer says: "Boys have taken hold of  
amateur printing as only American boys can  
push things. It has gone over the country like  
wildfire, and wholly because it deserves it. The  
novelty of the thing never ends, and beside  
the pleasure a boy finds he can earn his own  
pocket money at all times, easily and plentifully.  
Almost any boy can do all of his father's  
printing, and very nicely too, after a little ex-  
perience."A steam street pavement rammer is in op-  
eration in Philadelphia. It works on the principle  
of the ordinary steam hammer used in large**Ingots for Seamless Tubes.**—The Lon-  
don Mining Journal says: Some improvements  
especially applicable to the casting of hollow  
ingots of copper for the manufacture of seam-  
less tubes have recently been patented by Mr.  
William Webb, of Smethwick. The cylindrical  
mold is supported by a horizontal axis, which  
works in bearings in a fixed support. The axis  
is above the center of gravity of the mold, and  
the mold consequently takes a vertical position  
when free to move, and is fixed in this position  
during the casting process. It can, however, be  
turned upon its axis into a horizontal position.  
The central core is supported in the mold at  
bottom on the closed bottom of the mold, and  
at top by means of a bracket carried by the  
mold. At the top of the mold a shoulder is  
formed by turning away a portion of the metal,  
and upon this shoulder a funnel shaped recep-  
tacle is fitted, the receptacle opening into the  
top of the mold, and being capable of turning  
freely upon the shoulder. On the outside  
of the said funnel-shaped receptacle, and by  
preference near its base, is a bevel wheel, which  
gears with another wheel on the end of a hori-  
zontal axis which is furnished at its other end  
with a winch. By turning the winch the recep-  
tacle can be made to rotate. In using this  
apparatus the mold is fixed in its vertical po-  
sition, and the two bevel wheels are geared to-  
gether. By turning the winch the receptacle  
is made to rotate. The molten metal is poured  
into the receptacle, where it receives a rotary  
motion and then passes into the mold. The  
resulting casting is free, or nearly free, from  
the spongy or porous character which all cast-  
ings have more or less when the metal is  
poured directly from the melting pot or cruci-  
ble and allowed to fall with only a vertical mo-  
tion into the mold. After the casting has  
cooled the mold is brought into a horizontal  
position, and the hollow ingot is withdrawn  
from it.**Wash and White Lining for Brick**  
**Fronts.**—The following is said to have been  
found a successful plan in Chicago for giving  
a brick front a durable red wash. Venetian  
red and Paris brown, in proportion to suit the  
taste, are mixed with a quantity of water to  
make a heavy wash. With this the walls are well  
coated. To settle the color to the wall, and  
prevent its washing off by the rain, a wash  
with diluted muriatic acid (one quarter acid) is  
given over the painted surface. The mixture  
forming the white lines or joints is made of  
settled white lime, to which is slowly added  
plaster of Paris, kept stirring until the mixture  
is past setting; then mix a little fine sand to  
keep from cracking, and work into the consis-  
tence of glazier's putty. This putty is then  
applied to the wall by two men, along a straight  
edge, and with a beading trowel, the distance  
of the joints having previously been measured.  
Care should be taken in applying this putty to  
press it strongly against the wall to prevent  
any water from creeping between it and the  
brick. We have never seen any painted or  
washed fronts, however, which were as hand-  
some as those treated with plain boiled linseed  
oil. It takes a great deal to make a good job,  
but when it is done the appearance cannot be  
equaled by any method of painting. The front  
requires oiling from time to time afterward  
till the surface is thoroughly protected, then  
occasional coats may be needed, but not often.**Testing Welded or Soldered Boiler**  
**Plates.**—The method recently introduced of  
manufacturing boiler shells with welded seams,  
has led to the construction of a machine for  
testing the soundness of such welds, their  
adaptation and value for the purpose in ques-  
tion being of course primarily dependent on  
this quality. The contrivance consists of a  
fixed hydraulic cylinder, 12 inches in diameter,  
and of 12 inches stroke, connected to a trav-  
eling head by rectangular wrought iron bars 5 by  
2½ inches, pierced with cotter holes of 11 inch  
pitch; the platen attached to the hydraulic  
ram slides along the bars. When a boiler shell  
is to be tested, the traveling head is run out of  
the way along the rails, and the shell is run in  
on a truck; the head is brought back to its  
place, and the cotters are inserted in the near-  
est cotter holes. Pressure is then applied to  
the cylinder by means of hydraulic pumps, the  
ram forces the platen against the end of the  
shell, and the joint is in this way made ready  
for the testing process. The shell is now filled  
with water from a tank by means of a flexible  
hose inserted into a passage in the platen,  
while the air escapes by means of a tube in the  
traveling head, this tube being made to slide  
diagonally, so as to suit any sized shell; the  
tube is then closed by means of a cock, and  
the test pressure is applied by the hydraulic  
pump.**A Large Plate Contract.**—The St. Louis  
Commercial Gazette says: During the past week  
a new evidence of the growing confidence in  
the future of the iron industry was given by  
the arrival of Mr. Richard Ivers, of San Fran-  
cisco, who came here delegated by the city and  
country in which he resides to contract for 40,-  
000 tons of iron plate, to be used in the con-  
struction of pipes for conducting water from  
the uplands of the Sierra Nevada country to  
San Francisco, a distance of 120 miles. The  
magnitude of the undertaking and its great  
cost have been serious obstacles; but when the  
fact was established that there was an endless  
supply of clear, pure water in the Sierra  
country, the expenditure seemed warranted,  
and opposition to the outlay was materially re-  
duced. Some idea of the expense attending  
such an undertaking may be gleaned from the  
fact that the iron plate to be obtained in St.  
Louis will be in the neighborhood of \$2,000,000.  
Mr. Ivers paid a visit to the Vulcan Iron  
Works, Carondelet, recently, for the pur-  
pose of looking over the establishment and  
arriving at an idea of its capacity. Negotia-  
tions have been partially entered into with the  
Vulcan Company for the plate, and as soon as  
the contract therefor is perfected the work of  
manufacture will begin.



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## Cleveland, Brown &amp; Co.

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This Laboratory was established in 1866, at the instance of a number of practical Iron-masters, expressly to afford prompt and reliable information upon the chemical composition of the substances above mentioned, for smelting and refining purposes. The object being to make it as convenient, practically useful, and comparatively inexpensive as possible to the Furnace, Forge and Rolling Mill.

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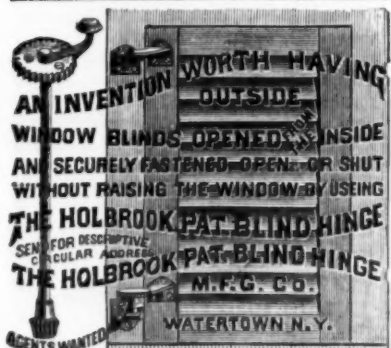
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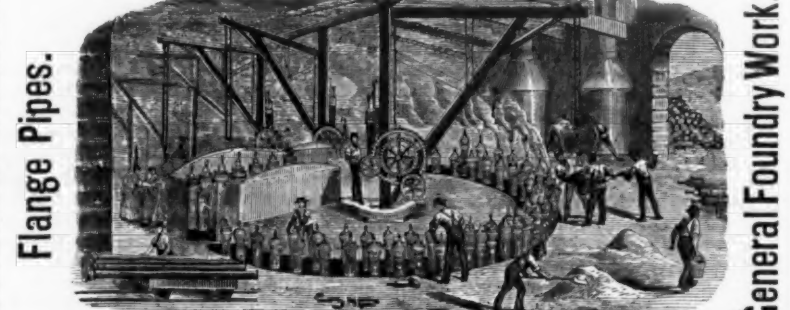
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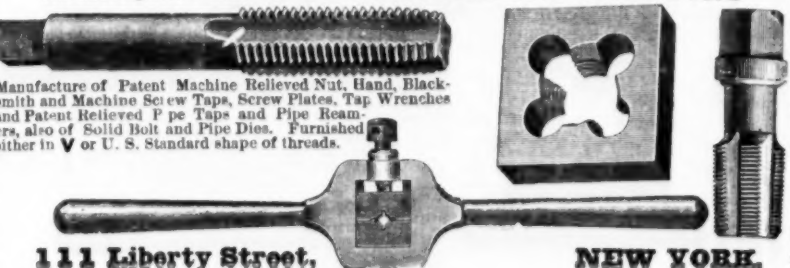
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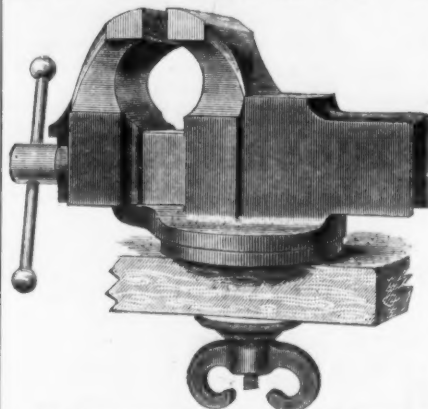
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The advantage claimed for this Vise over the ordinary patterns is in the ease with which it is adjusted to whatever angle may be required.

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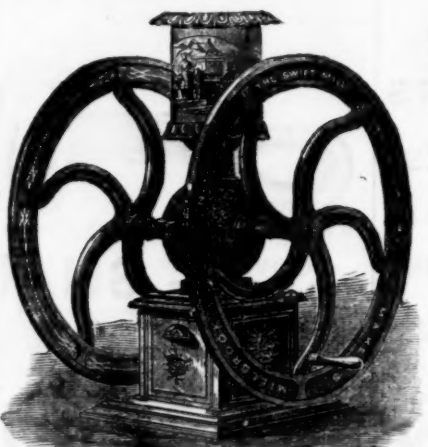
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P. O. Box 979.

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Manufacturers of all styles Plain and Ornamental Butts,

LOOSE PIN REVERSIBLE,

Cast Fast &amp; Loose

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Japanned, Figured Enamelled, Nickel Plated  
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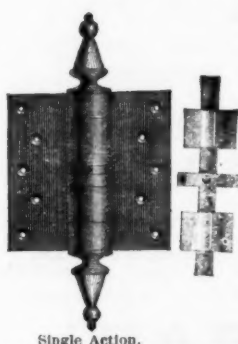
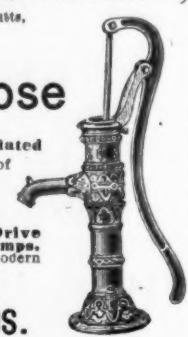
(Water, Well, and Force Pumps, Yard, Drive  
Well, Garden Engine and Steam Roller Pumps,  
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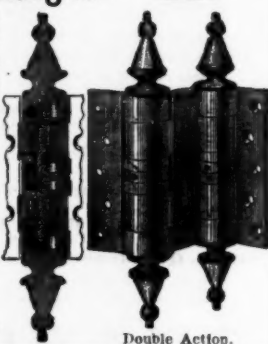
This Hinge has two flat coil springs, very powerful. It has a heavy solid pintal, giving much less friction than a hollow pintal. It has broad, solid bearings in the knuckle, which do not wear down readily and let the door sag. It is Fast Joint, therefore can be used for either right or left hand. By actual test it has an average of 50 per cent. more power than other Spring Hinges in common use of same size.

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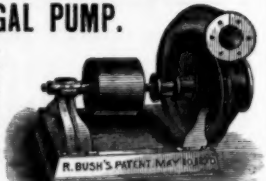
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## New Patents.

We take from the records of the Patent Office at Washington the following specifications of certain patents, lately issued, which will be found interesting:

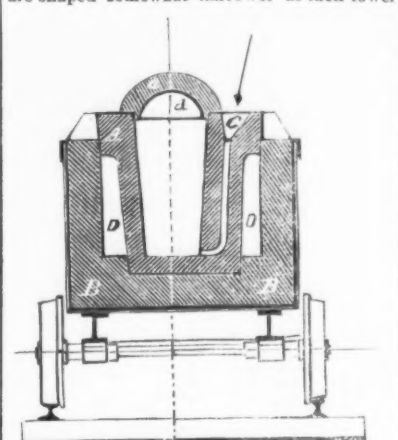
### IMPROVEMENT IN PROCESSES AND APPARATUS FOR REFINING METALS.

Specification forming part of Letters Patent No. 181,046, dated August 15, 1876, issued to John Corson and Frederick Winter, Washington, D. C.

The object of this invention is to prepare iron and other metals in a pure state for subsequent manufacture.

Figure 1 is a transverse section of a crucible A, inclosed in a jacket B, resting on a wheeled truck. Fig. 2 is a longitudinal section of the jacket and truck, showing also two of a group of crucibles.

The jacket B forms an outer case or box for the reception of one or a series of crucibles A, which, when there are more than one, are arranged longitudinally in a row. These crucibles are shaped somewhat narrower at their lower



IMPROVED APPARATUS FOR REFINING METALS.—Fig. 1.

end than at the top, so as to leave an intervening space or air chamber D between them. This air chamber D terminates at each end of the jacket, as shown in Fig. 2, d'. This air chamber thus forms one continuous connection inside, the full length of the jacket, round the sides of each crucible, and also under the arched cover, a, as shown in Fig. 1, d.

The jacket containing the group of crucibles being mounted on a wheeled truck, which rests on a tramway, the whole can be readily transported in any direction. When preparing for casting the ingots in the crucibles the whole apparatus is led up to a furnace in which hot air is generated to the blast flame from a gas pipe, or to their equivalent, and, being temporarily

2. The process described of refining metals by casting them in ingots in covered crucibles previously heated to the required uniform temperature, and not further heated after the metal is supplied to the crucible, except from the top, the metal being prevented from contact with outward or variable atmosphere, substantially as described.

3. The described method of refining a mass of metal at the lower part of the ingot or mass, and forcing the volatile and other impurities upward, by casting in a heated crucible deprived of variable atmosphere, and surrounded at sides and at top by caliducts, in connection with introducing the molten metal at the bottom of the mold.

### IMPROVEMENT IN PROCESSES OF ELIMINATING PHOSPHORUS FROM IRON.

Specification forming part of Letters Patent No. 182,371, dated Sept. 19, 1876, issued to John B. Kunkel, of Catonsville, Maryland.

This invention relates to processes of purifying iron from the phosphorus which has heretofore been practically inseparable from it, and producing in a cheap and simple manner iron free from any tendency to "cold shortness" when caused by the presence of phosphorus, and admirably adapted for use in the Bessemer converter; and the said invention consists in the abstraction of the phosphorus from the iron by means of magnesian compounds, and is applicable alike to the production of iron free from phosphorus direct from the ore, and to the purification of pig iron, the rationale of the process consisting in taking advantage of the great affinity exhibited by phosphorus for magnesia, which affinity seems not to be disturbed by any possible elevation of temperature.

In carrying out the invention proceed as follows: When operating upon phosphatic ores use, instead of the ordinary limestone flux, dolomite, or magnesian limestone, a well-known double carbonate of lime and magnesia. The charges of ore, carbonaceous matter and dolomite are fed into the ordinary blast furnace in the usual way, the proportions of ingredients being substantially the same as when ordinary limestone is used as a flux, and governed by like conditions, namely, the relative amounts of oxide of iron, silica, and lime naturally in the ore. Should the ore be extraordinarily phosphatic it is advisable to increase the charge of dolomite from 10 to 100 per cent. A portion of the dolomite may be introduced through the tuyeres.

The working of the furnace being, under the above conditions, in no wise different from the ordinary practice, and being well understood by those practicing the art, need not further be adverted to.

When operating upon metallic iron to eliminate its phosphorus, apply the dolomite either in the cupola or puddling furnace, as

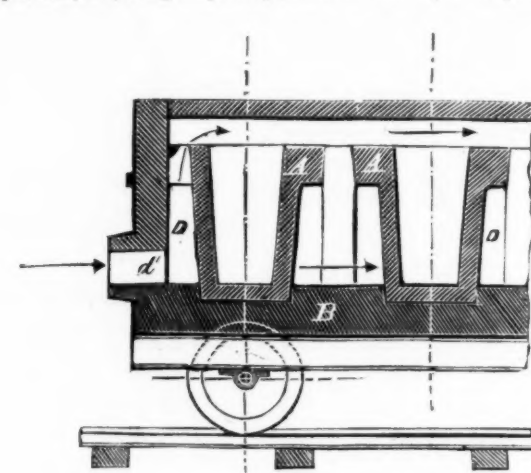


Fig. 2.

connected thereto at d', a blast or current of hot air is forced in the direction of the arrows on Fig. 2, entering through the opening d', and circulating through the chamber D and under the arched cover a, eventually passes out at d'. Thus the spaces between the several crucibles and those intervening between them and the inner sides of the jackets, as well as the space d' under the arched cover a, form one connected caliduct, through which heated air circulates in the direction of the arrows shown in Fig. 2. Having by this means thoroughly heated the several crucibles to a required degree of temperature, and removed all the outer atmospheric influence, the caliduct is disconnected and the truck is removed on the tramway as near to the reservoir of the smelting furnace as required. The molten metal is then poured through the opening mouth C, each crucible being successively moved into proper position near the furnace reservoir. The outer atmosphere having been expelled, and the molten metal coming into immediate contact only with surfaces of uniform temperature, none of those violent shocks follow, which largely contribute to flaws and produce oxidation.

Metal cast in crucibles, as herein set forth, also will contain no air cells.

The process effects another beneficial result. The heated crucibles and surrounding heated air of uniform temperature offering no counteracting influence or "chill" to the inflowing mass of metal, it immediately commences to settle rapidly, to filtrate and precipitate in obedience to the laws of gravitation, as well as to chemical and other influences peculiar to metals in their fluid state. All the impurities are forced upward, and the lower contents of the crucible become densely compact.

Claim.—1. The caliduct, composed of the crucible surrounding chamber D, the arched space d' beneath the cover, and the inlet and outlet passages d' and d', communicating there-  
with.

rod, which slides back and forth across the face of the revolving grinder. The blanks are pressed against the grinder by a cam, which revolves against the loose upper ends of the holders. The cam carriage is adjusted to and from the blank holder carriage by a thumb screw, and is also pivoted so as to turn laterally when a cam attached to the blank carriage strikes the beveled corners of the cam carriage.

182,591.—Wrench.—A. M. Mortimer, Salt Lake City, Utah.—Sept. 26.

182,610.—Mortising Chisel.—E. S. Smith, Whites-town, N. Y.—Sept. 26.

The throat of the chisel is made rectangular in cross-section, and of gradually increasing diameter from the bottom upward, for clearing the mortise of the core or chips as the chisel is withdrawn.

### MODE OF UTILIZING OLD RAILS.

To Jacob Reese, Pittsburgh, Pa.—Sept. 26.—The method herein described of utilizing old rails or rail ends in the manufacture of sheet or plate metals, consisting of, first, cut-



ting the rails or rail ends to suitable lengths; second, separating the flange from the web and head; and, third, presenting the pieces so prepared to the rolls sidewise; that is, the axis of the piece parallel to the axis of the rolls, and thus reducing the piece to a sheet or plate by spreading it in a direction transverse to its longitudinal axis.

182,651.—Wire Stretcher.—R. Ellwood, Sycamore, Ill.—Sept. 26.

The device is placed over a fence wire, so that the wire will enter space d, and, by means of a wrench applied to shank e, the wire is drawn taut around hook or catch c, and held by a pin, which is inserted through holes f in the two discs a a', above the wire on one side and below it on the other.

182,654.—Wash Boiler.—Josiah W. Field, Rockford, Ill.—Sept. 26.

An interior case conoidal, the smaller end at top open, and having a horizontal flange perforated; the base line "boat shaped," and having side perforations and cross wires on a lower plane than the edge.

The following trade-mark was duly registered during the week ending Sept. 26:

4023.—Rubber Goods.—Union India Rubber Company, New York, N. Y.

"The words 'Union India Rubber Company.'"

**Improvement in Telegraphy.**—An English engineer has invented a new telegraph joint, which, it is claimed, presents a simple, cheap and efficient means of dealing with one of the practical difficulties of subterranean telegraphy—one, in fact, that seemed almost insuperable. This new joint is formed by removing the coatings from the two ends to be united and joining the cleaned wires by what is technically known as the "bell-hanger's twist," no solder being necessary. The twist is then warmed slightly and covered with a rough coating of insulating compound, somewhat thicker than the original diameter of the wire. The joint, while warm, is placed in the lower half of a small wooden block about three inches long and one inch wide, fitted internally with a groove for the wire, widening in the middle into a niche about one and one-half inches in length for the reception of the compound covered joint. While the compound is yet warm the upper half of the mold—in shape corresponding exactly with the lower one—is placed on the top, and, by means of a clamp, screwed down until the two wooden surfaces are pressed firmly together. While in this position they are permanently fixed by half a dozen ordinary brass screws, and the compound having hardened the clamp is removed and the joint complete. The cavity in the interior of the block in which the copper ends meet being completely filled with the compound, the insulation is all that could be desired, numerous experiments having satisfactorily tested the electrical qualities of the arrangement, the wooden covering obviating all danger of "leakage" or separation of the wires through bending.

**The Channel Tunnel.**—The British Society of Engineers publishes the following details of the preliminary works for the tunnel under the channel: The year 1875 was profitably employed. The outlay amounted to 61,000 francs, the half of which, or 30,500 francs, had been expended in geological researches at the end of December, as shown in the report presented at the first general meeting on the 15th of March, 1875, by M. Lavalley. The result of the first year's labors is contained in four reports, which were then distributed, and which describe the bases on which the studies are founded. This year the surveys have continued on a larger scale. In 1875, 1522 soundings were taken, of which 753 brought up specimens from the bottom of the sea. The engineers had at their services the Pearl, a small steam tug with insufficient appliances, and with which they worked between August 10 and September 21, during which time they could only leave the port of Boulogne twenty times. This year the soundings have been effected on the English side with a large vessel fitted with a crane and better provided. The work commenced at the beginning of July, and the vessel is stationed at Dover, which port it can enter or leave at all hours. Greater progress in the formation of the company has, however, been made in France than in England. The 2,000,000 francs required for the preliminary surveys have not yet been raised.

Claim 1. The process of eliminating phosphorus from iron, the same consisting in reducing the oxide of iron to the metallic state in presence of dolomite, substantially as described.

2. The process of purifying metallic iron and eliminating phosphorus therefrom, the same consisting in treating the molten metal with dolomite, substantially as described.

We take the following abstract of new patents, recently issued, from the official record:

182,543.—Manufacture of Boxes.—Wm. H. Allen, N. Y.—Sept. 26.

Blanks are cut from a sheet of leather-board moistened and struck up in a die, after which they are treated with oil and coated with shellac.

182,588.—Shovel Grinding Machine.—W. A. Meyer, North Easton, Mass.—Sept. 26.

A series of blank holders, are journaled on a



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Pawtucket, R. I.

The American File Company have the exclusive right to use the Bernot process for cutting files. By this method all the advantages of hand cutting are secured, together with an accuracy unattainable in hand work. They are the only manufacturers who employ machinery for testing files and steel.

Goods of all known manufacturers have been repeatedly tested, and interesting tables have been compiled showing the working qualities of files made by different makers, and of files made from different steels, and with various shapes and angles of tooth. They have thus reduced the manufacture of files to an exactness and perfection with a uniformity of result, as they believe, never before attained. No file, foreign or domestic, that they have ever tested, has equalled the performances of their own goods taken at random from their stock. Their machines are capable of the most delicate adjustment, and can produce the very finest work known to the trade. Special files made to order. Prominent file manufacturers are having their best goods from our works.

Price lists and information furnished on application.

AMERICAN FILE CO., Pawtucket, R. I.

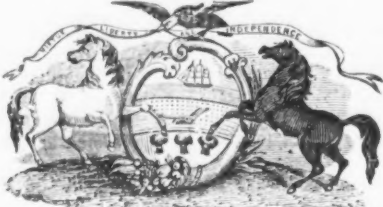
## THE BEST IS THE CHEAPEST.

McCaffrey's Standard American Hand Cut Files and Rasps are warranted to do more work than any other files and rasps in the market.

SILVER MEDAL

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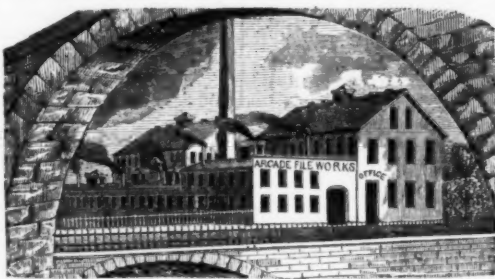


**PENNSYLVANIA FILE WORKS.**  
**McCAFFREY & BRO.,**  
No. 1732, 1734 & 1736 North Fourth St., Phila.

Messrs. ARNOLD & CO., 310 California St., San Francisco, Sole Agents for the Pacific Coast.

ESTABLISHED 1848.

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Sole Agents, N. Y.  
Manufacturers of SUPERIOR  
**HAND CUT**



**FILES and RASPS**  
Made from Best  
**ENGLISH CAST STEEL.**  
Quality guaranteed by written warranty  
when required.

**AUBURN FILE WORKS,**  
Superior Hand-Cut

**FILES AND RASPS,**

MADE FROM IMPORTED STEEL. EVERY FILE WARRANTED.

**FULLER BROS., Sole Agents,**

89 Chambers and 71 Reade Streets, N. Y.

ELLAS G. HELLER.  
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**HELLER & BROS.**  
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NEWARK, N. J.

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We invite the attention of  
the trade to our Celebrated  
American

**Horse Rasps  
and Files,**

Made from the very best American Steel, all cut by hand,  
and warranted to give entire satisfaction. If requested,  
we will send sample lots, to be returned or held subject  
to our order, free of all charges, if not found as represented.  
All Rasps not stamped as the registered trade mark are not genuine. Sold by Hardware  
dealers generally.

**FILES & RASPS,**  
Best Cast Steel.  
HAND-CUT. Manufactured by  
**JOHNSON & BRO.**  
No. 1 Commercial Street, Newark, N. J.

Established 1835. **TRADE MARK ON**  
New Pattern

**JOHN ROTHERY**  
T M  
MATTEAWAN  
N. Y.  
**Horse Rasps,**  
John Rothery's  
**HAND-CUT FILES and RASPS,**  
Made from English Cast Steel.  
**JOHN & WILLIAM ROTHERY,**  
Matteawan, N. Y.



Putnam's Government Standard  
**FORGED**

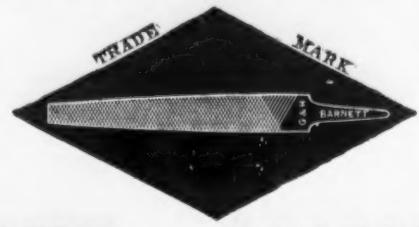
**Hammer Pointed  
HORSE SHOE NAILS.**  
READY FOR DRIVING.

Manufactured from the best of NORWAY Iron  
and warranted to give entire satisfaction.

**S. S. PUTNAM & CO.,**  
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## Black Diamond File Works.

Send for illus-  
trated Price List.



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trated Price List.

**G. & H. BARNETT.** 39, 41 & 43 Richmond St. Phila.  
**LINFORTH, KELLOGG & CO.**

Sole Agents for the Pacific Coast, 3 & 5 Front St., San Francisco, Cal.  
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**THOS. TAYLOR,** 43 Chambers St., N. Y., Agent for N. Y. and N. E. States.

Established 1816.

**Peter A. Frasse & Co.,**

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**FILES AND HORSE RASPS,**

And Importers of

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**THOS. JOWITT & SONS, SHEFFIELD,**

Manufacturers of every description of

**FILES.**

Forged, Ground and Cut by  
Hand and Tempered by an  
Improved Process.

Manufacturers of

**CAST, SHEAR & BLISTER  
STEEL**

For various purposes.

Granted according to Act of Parliament, and Registered in Germany and the United States.

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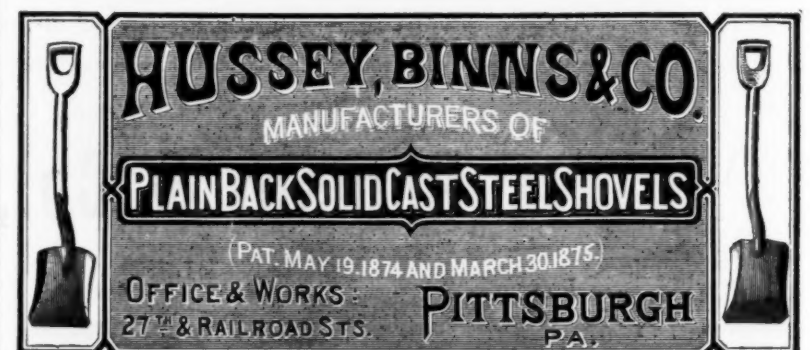
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**CHARLES B. PAUL,**  
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CAST STEEL.

187 Tenth Street, Williamsburgh, New York.

All descriptions of Files made to order. Price List mailed on application.

Established 1863



**OLD COLONY IRON CO.,**  
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MANUFACTURE

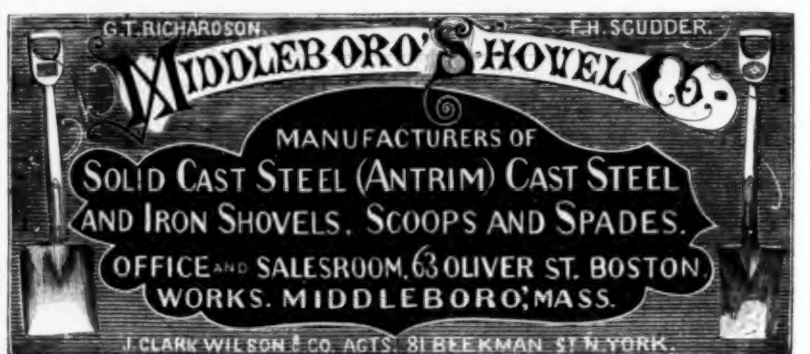
**Nails, Shovels, Spades, Scoops, &c.**

**SOLID CAST STEEL GOODS MADE TO ORDER.**

Warehouse, 211 Pearl St., N. Y.

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MANUFACTURERS OF  
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MANUFACTURERS OF EVERY DESCRIPTION

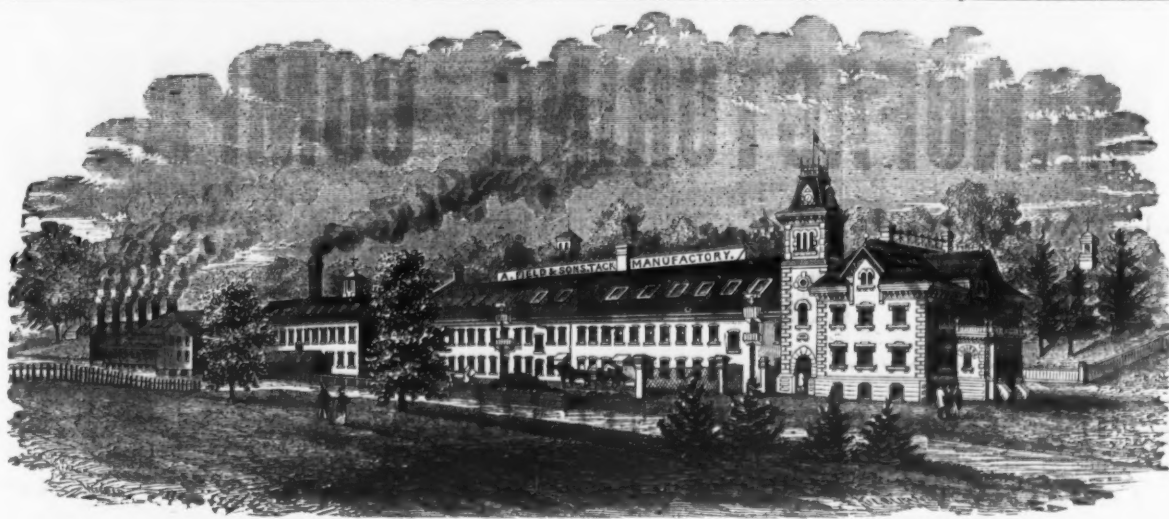
—OF—  
**FILES and**

**RASPS.**

**Alfred Field & Co.,**  
93 Chambers & 75 Reade Sts.,  
NEW YORK CITY,  
GENERAL AGENTS.

All Goods Warranted.





## A. FIELD & SONS,

TAUNTON, MASS., Manufacturers of  
COPPER & IRON TACKS, TINNED TACKS,

SUPERIOR SWEDS IRON TACKS, for Upholsterers' Use, Saddlers' Supply, Card Clothing, etc., etc.

**American and Swedes Iron Shoe Nails,**

Zinc and Steel Shoe Nails, Carpet, Brush and Gimp Tacks, Common and Patent Brads, Finishing Nails, Annealed Trunk and Clout Nails, Hob and Hungarian Nails, Copper and Iron Boat Nails, Patent Copper Plated Tacks and Nails.

Fine Two Penny & Three Penny Nails, Channel, Cigar Box & Chair Nails, Leathered Carpet Tacks, Glaziers' Points, Etc.

OFFICES AND FACTORIES AT TAUNTON, MASS. WAREHOUSE AT 78 CHAMBERS STREET, N. Y., where may be found a full assortment of Tacks, Brads, &c., for the accommodation of the New York Wholesale and Jobbing Trade.

Any variations from the regular size or shape of the above named goods made from samples, to order.

**Hoisting Machinery**  
Manufactured by  
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Our New Illustrated  
Catalogue and Price List of  
**SCALES**  
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**SPRING BALANCES**  
is now Ready and will be sent to the  
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**John Chatillon & Sons,**  
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### PRIZE MEDALLISTS:

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**CLARK & CO.,**

Original Inventors and Patentees

OF

Noiseless Self-Coiling Revolving  
**STEEL SHUTTERS,**

FIRE AND BURGLAR PROOF.

Also Improved

**Rolling Wood Shutters**

Of various kinds, Clark's Shutters are the Best and Cheapest in the world. Are fitted to new Tribune Building, Lenox Library, Delaware and Hudson Canal Co.'s Building, Transatlantic Steamship Co.'s new Dock, American News Office, &c., Posey County Court House, Mt. Vernon, Holt County Court, Oregon, Mo. Also to buildings in Boston, Cincinnati, Detroit, Jansenville, Wis., Baltimore, Canada, &c. Have been for years in daily use in every principal city throughout Europe, and are endorsed by the Leading Architects of the World.

Office and Manufactory,

162 & 164 West 27th Street, N. Y.

ESTABLISHED 1859.



TRADE MARK, PATENTED.

**PRINCE'S METALLIC PAINT,**

AN INDESTRUCTIBLE COATING FOR

IRON, TIN, OR WOOD,

For Sale by the Trade and

**PRINCE'S METALLIC PAINT CO.,**

Manufacturers,

225 Pearl Street, New York.

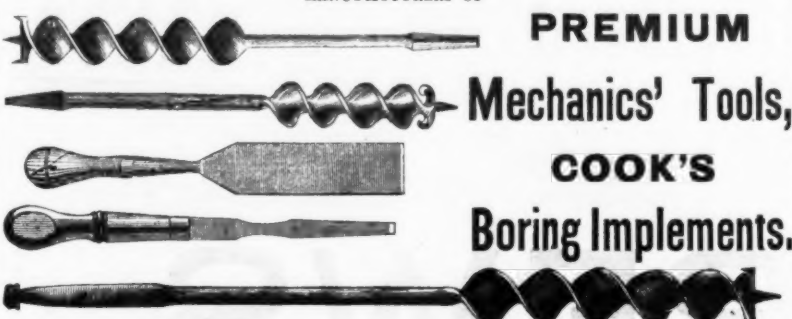
Caution.—As certain parties are offering for sale a SPURIOUS PAINT, under an imitation name, purchasers will please see that our TRADE-MARK is on every package. None other genuine.

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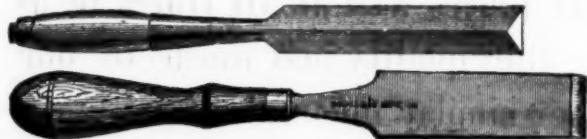
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FACTORIES, Seymour, Conn.

MANUFACTURERS OF



Chisels, Gouges and Drawing Knives of all kinds, Screw Drivers, Screw Driver Bits, Cook's and Douglass Mfg. Co.'s Augers & Bits, Wood and Metal Head Gimlets, Improved Hollow Augers, Blake's Patent Extension Bits, Boring Machines, Chisel Handles, Wood Boxes, Tool Chests.

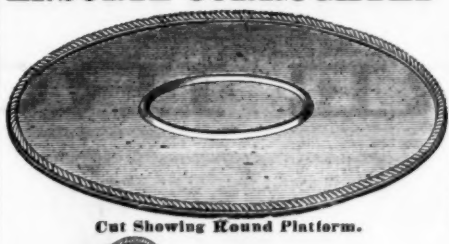


## ANSONIA CORRUGATED STOVE PLATFORM

Manufactured by the

Ansonia Brass & Copper Co.

Office, 19 & 21 Cliff Street,  
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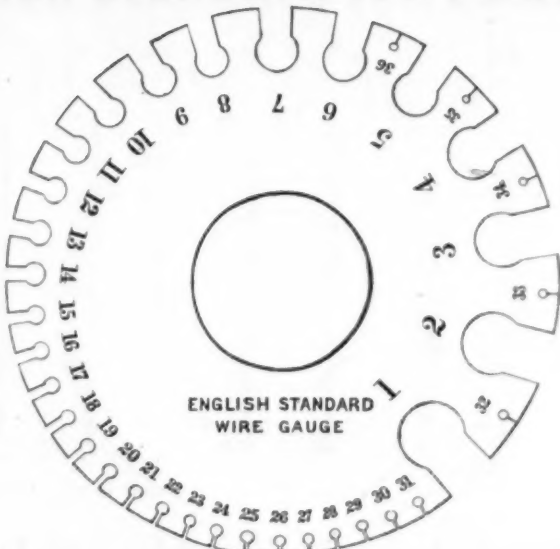
Cut Showing Round Platform.



Section Showing Edge.

The Ansonia Corrugated Stove Platform, with its heavy figured edge border, is believed to be the best Platform offered to the trade. As shown in the illustrated section herewith it requires no nailing to keep it in place or to prevent it from turning up at the edge; while the metal is of sufficient thickness to require no lining. The low price, superior quality and fine finish of this Platform will be readily acknowledged. Packed 100 in a case. Send for price list.

## English Standard Wire Gauges



ENGLISH STANDARD  
WIRE GAUGE

MADE BY

**DARLING, BROWN & SHARPE, Providence, R. I.**

### Foreign Competition with British Metal Goods.

The London Mining Journal prints the following significant article:

Neither in our iron nor our hardware centers has trade yet sufficiently revived to make manufacturers careless about foreign competition. The manufacturing energies of countries on the other side of the British Channel, and of the wonderful nation which our forefathers planted across the great Atlantic have developed in late years with great rapidity. The steam engine is the property of no people in particular, though it may be that steam is a motor the most readily available to the nation possessing most coal. But here again the progress has been so striking that power can now be got with a consumption of fuel at one time deemed impossible. Both by land and by sea this has more greatly benefited our own than any other nation, yet it is doubtful if the proportionate benefit has not been so conspicuous in the case of those who are our competitors as to conspicuously reduce our former competitive ability. The temptation to overproduction which ensues upon every period of temporary activity is so great under the modern facilities of production that it is usually too powerful to be resisted, and when depression comes, which now more than ever falls upon all, all find themselves in more than common need of work—for machinery must be kept productive, and workmen must have employment. The late inflation in the United States was promoted by the war between the Northern and the Southern States, and the yet more recent inflation in Europe was that which originated in the Franco-German war. Neither of these conflicts had long ceased before first the New and then much of the Old World was deficient of orders in almost every branch. Aided by a prohibitory tariff the New World now found itself capable of supplying its own wants in almost all departments. But so greatly in excess of its wants had been its preparations that it sought even to sell to those from whom before it had mainly to buy. What was true of the United States of America was largely true of monarchical Belgium, of imperial Germany, and of republican France. All had to seek fresh customers, and where should they seek them but where they were the most wealthy. Great Britain is the wealthiest nation upon the face of the earth, and to England America, Belgium, Germany and France have brought the wares which they make in common with ourselves. And here they are thrusting them upon our attention with a pertinacity which, taken in connection with the loss of former custom, may fairly arouse in British manufacturers sentiments much more excusable than those of mere jealousy.

Hence we find that men of no less trade mark than the Council of the Birmingham Chamber of Commerce are complaining of foreign competition in even so authoritative a document as the half-yearly report of that chamber. The trade and general industries of the town were, they said, suffering from depression. The council could see but one mode of competing successfully with the recent rapid development of the manufacturing energies of other countries, and that was by returning to the former habits of untiring industry, excellence of workmanship, and soundness of material, upon which their former superiority was based, and which could only be rendered permanent by moderate profits, reasonable wages, fair hours of labor and conscientious work. We can scarcely think that the manufacturers would have us infer all that is fairly deducible from this language. Whether we do or not, they may be quite sure that their enemies will be quick enough to read between these lines. For ourselves, we had thought that much of the business done here and elsewhere by ironmasters and hardware manufacturers outside this country was due more to causes—various in various places—which enabled them to quote prices under those which our expenses made it necessary that we should require. Here, however, we have imperfect workmanship and poorness of material and excessive profits hinted at as amongst the causes which contribute to the loss of that business which our competitors have gained. Doubtless a portion of this defect may be made up by workpeople being content with reasonable wages, by their laboring longer hours, and by their putting conscientious work into the products upon which their skill may be expended; but the difficulty would not hereby be wholly met. Judging by recent declarations, possessing considerable authority, we had thought that some of the products of our competitors showed striking inferiority to our own, justifying the use in respect of them of such a term as "trashy." If that be not applicable to all Germany's exhibits at the Centennial, it is declared to be applicable to the great bulk; and we had imagined that not a few of the "notions" of America scarcely accorded with the views of English judges of what is a good and serviceable, and, therefore, salable article, however excellent, for example, may be her axes and certain other of her edge tools. It may be, as the Chairman of the Chamber phrased it, "most painful to notice the falling off of the American trade in Birmingham," and they might have, as he claimed, "a great deal to fear from American competition," now so keen, that it appeared in the sending of American electro-plate to that town of all others in the world. But who will assume that the Americans are sending wares of that sort to Birmingham, because they make a better quality than that for which Birmingham is everywhere famous.

Birmingham, we fear, is writing against itself bitter things, hardly justified by the facts. In Birmingham, as in Sheffield, Leeds, London, Glasgow and elsewhere in this country, Belgian girders are being used by English builders in English erections, but it is not because those girders are better than English girders, but be-

cause they are cheaper. Also, that they should be cheaper, no doubt. But it needs mainly that, by whatever means effected, our own prices be brought down, and we shall hear but little of the competition which is believed to reflect so discreditably on English ironmasters and hardware firms. For the encouragement of our friends in Birmingham and Sheffield we will give them the results of our own experience. Only a few days ago an order representing 200 tons of finished iron of miscellaneous sizes, from small rounds up to singles, was given by a firm of merchants in the North of England to an iron making firm there in preference to placing it with the agent of Belgian iron makers. Why? Because the prices quoted by the English house are cheaper now than they were at an earlier date, when a similar order was given by the same buyer to Belgium in preference to England, solely because at that time Belgium under quoted England. Economy in working charges must be the perpetual aim of English manufacturers; and English workmen, if they are wise, will unite with them, even as it is a fact that Belgian colliers consented only very recently to take lower wages to enable their masters to carry on their pits and stock coal, which is now being rapidly cleared off. Working heartily together, British men and masters would soon accomplish all round what has occurred in the one instance we have quoted. Thus should we tide over the current period of depression. When trade moves we shall hear but little about our competitors, for our competitors will then have enough to do to supply the markets which may be described as naturally their own, without troubling us in England. Seeing, however, that the steam engine is every man's friend, and is ready to serve all English manufacturers and English mechanics would grievously err in supposing that their superabundance of coal and of iron and the accessibility of their shores give them the unapproachable pre-eminence in the manufactures of iron and other useful metals which once distinguished them.

### Lafayette's Sleeve Buttons.

Gen. Hawley has received from the Scovill Manufacturing Company, of Waterbury, Conn., a pair of sleeve buttons, fac-similes of a pair made by that company for the Marquis de Lafayette, in 1824. They are intended for the French Commission. The following is the correspondence respecting the matter:

WATERBURY, Conn., Oct. 28, 1876.

"My Dear General Hawley: May I ask you as a special favor to deliver or cause to be delivered to the gentlemen of the French Commission on behalf of the Scovill Manufacturing Company, the accompanying package and the note, which is left open for your perusal, and which will, I trust, afford sufficient explanation and reason for my request.

"Thanking you in anticipation for your kindness, I remain, yours truly,

"F. J. KINSBURY."

WATERBURY, Conn., Oct. 28, 1876.

To the Honorable Members of the French Commission at the United States Exhibition of 1876—GENTLEMEN: The Scovill Manufacturing Company, of Waterbury, Conn., beg your acceptance of the accompanying box and its contents as a slight memento of your visit to this country and also of its historical incident, of much interest to them.

"When, in 1824, the venerable Marquis de Lafayette revisited, after an absence of almost fifty years, the country which he had so nobly helped to make free, this nation rose up as one man to do him honor.

"Our predecessors, the Messrs. Leavenworth, Hayden & Scovill, although then pursuing a business of small extent in an obscure village, were animated by a desire to do their part toward honoring their nation's benefactor and guest. They therefore caused to be prepared a set of buttons of solid gold, each bearing a medallion profile of General Washington, as the design most suitable for their purposes. These buttons they hoped to be able to present to the Marquis on the spot where they were made, but circumstances having prevented his visit to Waterbury, the presentation took place in the city of New York.

"The die with which they were made has ever since remained in possession of this company, and the buttons here enclosed are in all respects a true copy of those presented to Lafayette, except that they are gilded instead of solid gold.

"The little industry, then in its infancy, has expanded into a great and important business, employing some millions of capital and many hundred men, while the village has grown to a city of some thousands of people.

"And now, at the end of another half century, on this occasion of the jubilee of manufacturers and the Centennial celebration of our nation's birth, we take pleasure in calling to remembrance, though in this humble way, our country's obligations to France and Lafayette, and the pleasant memories of that second visit.

"With assurances of our profound esteem for each of you personally, we remain, gentlemen, your obedient servants,

"THE SCOVILL MANUFACTURING CO."

### A Tall Lighthouse.—The British Mail

says: The firm of Call & Co. have begun the construction of the great lighthouse which is to stand on the brow of the Trocadero, in Paris, during the Great Exhibition of 1878. The lighthouse, 413 feet in height, has been ordered for Plymouth, and its white and red lights will be seen seven leagues on the main. It will contain ten rooms for attendants, two provision bunkers, an infirmary, and a bedroom with ten beds for the shipwrecked. About 5 meters (162 feet) above the level of the sea, movable annular plate is provided, carrying big cannon for shooting the salvage line with a range of 8000 to 10,000 meters. Near the base of this gigantic pharos there is a complete and improved lifeboat arrangement, which allows of a lifeboat being lowered by one man.



# RUSSELL & ERWIN MANUFACTURING COMPANY,

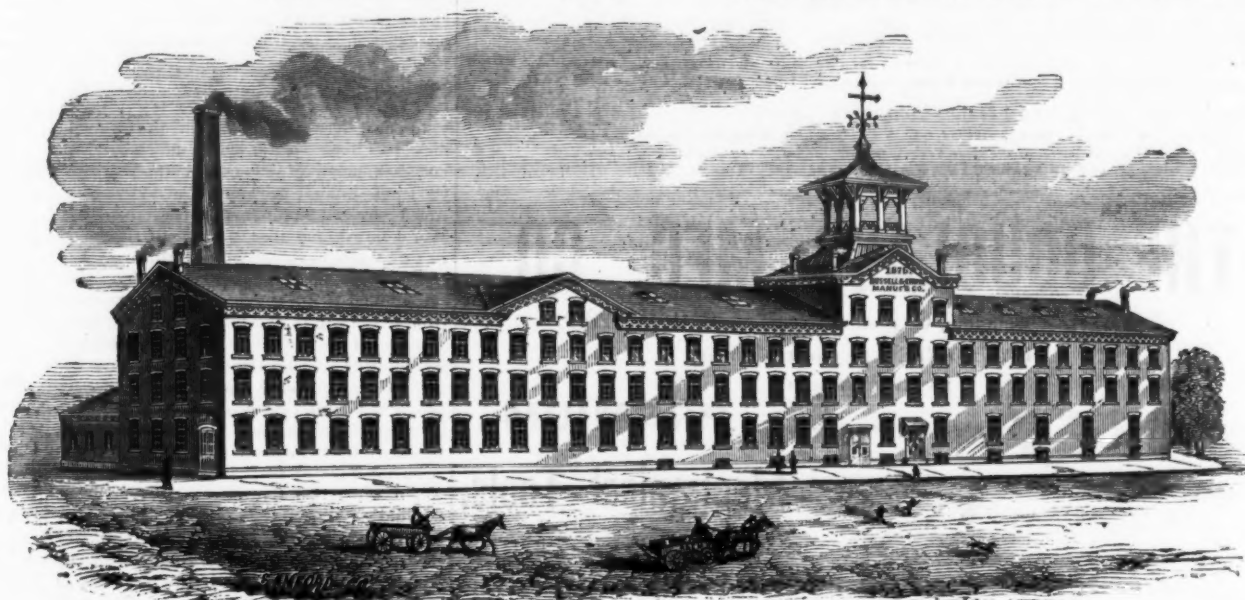
## MANUFACTURERS OF HARDWARE.

Factories, NEW BRITAIN, CONNECTICUT, U. S. A.

Manufacturers' Agents and Jobbers of General Hardware at our  
**WAREHOUSES,**

NEW YORK, - - Nos. 45 and 47 Chambers Street.  
PHILADELPHIA, - - No. 425 Market Street.

SOUTHERN DEPARTMENT,  
BALTIMORE, MD., WM. H. COLE, Agent, 17 South Charles St.



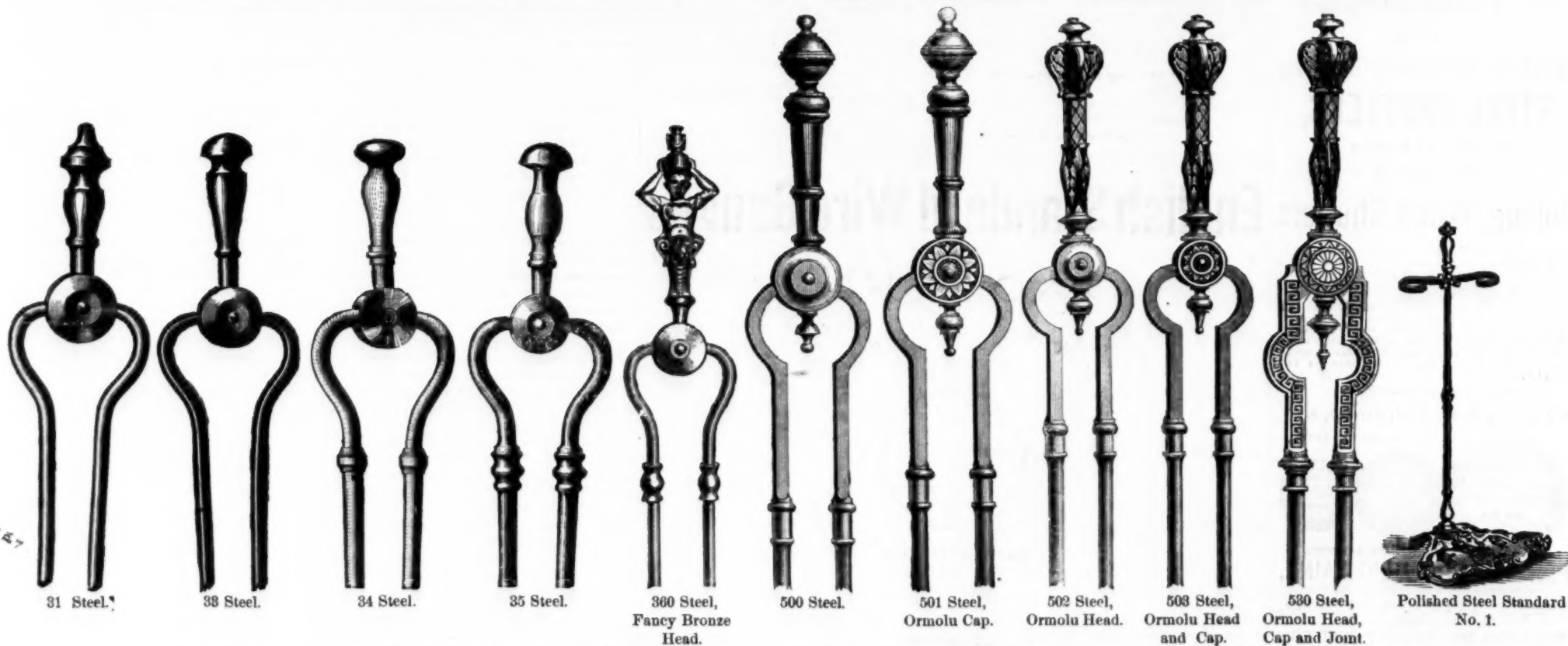
# SCREWS.

The above correctly represents our **NEW SCREW FACTORY** only, from which we are now turning out Five thousand gross per day of Flat Head Gimlet Point Screws of unequaled quality and finish.

We solicit orders for these goods, and our prices will at all times be as low as those of any standard manufacturer, and in all cases we **GUARANTEE** the quality and finish of our Screws, and invite a comparison under the **SEVEREST TESTS** with any other similar manufacture.

Our Screws are all packed in our new Patent Paper Boxes, bearing our labels, on which are **LARGE FIGURES** denoting the Size and Number.

## POLISHED FIRE IRONS.



Send for Special Catalogue and Price List of these goods. Also see Trade Report of *The Iron Age* of Nov. 9th, for description of additional styles, cuts of which will shortly appear.



## Cutlery.

## FRIEDMANN &amp; LAUTERJUNG,

MANUFACTURERS OF

Pen and Pocket Cutlery, Solid Steel Scissors, Shears, Razors,  
Russia Leather Strops, Hones, &c.

Sole Proprietors of the renowned full concave patent

**"ELECTRIC RAZORS,"**And the celebrated **"ELECTRIC SHEARS."** Nickel Plated  
Bows.

Agents for the BENGALL RAZORS.

AMERICAN TABLE CUTLERY, BUTCHER KNIVES, &amp;c.

91 Chambers and 73 Reade Sts., N. Y. 423 N. Fifth St., ST. LOUIS, MO.

**MERIDEN CUTLERY CO.**  
Received the HIGHEST CENTENNIAL PRIZE.MANUFACTURE ALL KINDS OF TABLE CUTLERY.  
Exclusive Makers of the "PATENT IVORY" or Celluloid Knife, the most durable WHITE HANDLE  
known. The Oldest Manufacturers in America. Original Makers of the HARD RUBBER HANDLE.  
Always call for "Trade Mark" "MERIDEN CUTLERY CO." on the blade. Warranted and sold by all Dealers  
in Cutlery, and by the MERIDEN CUTLERY CO., 49 Chambers Street, New York.

## HALL, ELTON &amp; CO.,

Electro Plated Ware, German Silver and Britannia Spoons.



Factories, Wallingford, Conn.

Salesroom, 75 Chambers Street, New York.

## THE MILLER BROTHERS CUTLERY CO.,

Manufacturers of

**PATENT FINE PEN & POCKET CUTLERY**  
WEST MERIDEN, CONN.The only Knives made that are put together in such a manner that there is no strain on the covering or frail part of the knife. We warrant our knives equal in cutting qualities and workmanship to any made, and are acknowledged by English makers as the **Best American Knife**. We also make**NICKEL & SILVER PLATED POCKET KNIVES**

which will not rust or become discolored when used as a Fruit Knife, and their cutting qualities are equal to any other knife. Orders filled from the factory, and in New York by Messrs. J. Clark Wilson &amp; Co., No. 81 Beekman Street (who have a full stock of all patterns always on hand), and also by Messrs. G. B. Walbridge &amp; Co., No. 99 Chambers Street.

## NAUGATUCK CUTLERY CO.,

Manufacturers of FINE PEN &amp; POCKET CUTLERY.

FULLER BROS., Sole Agents, 89 Chambers and 71 Reade Sts., N. Y.

## JOSEPH S. FISHER,

No. 411 Commerce St., PHILADELPHIA

AGENT FOR

George Wostenholm & Son,  
"Limited."Washington Works, SHEFFIELD,  
Celebrated I-XL Cutlery, Razors, &c

AGENT FOR

WALTER SPENCER & CO.,  
Steel and File Manufacturers,

Rotherham, ENGLAND.

Corporate Mark.

NO SPENCER  
ROTHERHAM

Granted 1777.

## VAN WART, SON &amp; CO.

Hardware Commission Merchants,  
EXPORTERS AND IMPORTERS,  
BIRMINGHAM, - ENGLAND,  
Agents.

McCOY &amp; COMPANY,

154 &amp; 156 Duane Street, N. Y.

George H. Gray & Danforth,  
48 India Street, Boston.

F. W. TILTON,

17 Old Levee Street, New Orleans.

At each of these places a complete assortment of samples of Hardware and Fancy Goods will be found, including all new descriptions. Sole Agents for

John Rimmer & Son's Celebrated  
Hammers and other Needles.

W. Clark's Genuine Horse Clippers.

Seydel's "Ashantee" Pocket Hammer

McCOY &amp; COMPANY,

BORAX A SPECIALTY,

134 &amp; 136 Duane St., New York.

## ASLINE WARD,

101 and 103 Duane Street, N. Y.

REPRESENTING

GEO. WOSTENHOLM & SON,  
"LIMITED."CUTLERY AND RAZORS,  
Washington Works, Sheffield.

CORPORATE MARK.

FREDERICK WARD & CO., Sheffield,  
Cutlery and Table Knives.

CORPORATE MARK

B4\*ANY

Bradford &amp; Anthony

BOSTON, MASS.

Sole Agents in the United States for

FORBES PATENT

ACME CLUB SKATES.

Which is without question the Best Self-Past-  
ening Skate yet produced. BRADFORD &  
ANTHONY are also Sole Selling Agents for

WINSLOW'S POPULAR SKATES.

A full line of all qualities and descriptions.

SKATES &amp; SKATE STRAPS.

Send for general Catalogue.

HARDY &amp; CO.,

Manufacturers of

Police &amp; Fire Department

SUPPLIES.

Brass, German Silver &amp; Leather Dog Collars.

102 ELM STREET, NEW YORK.

## Cutlery.

ESTABLISHED 1852.

## NEW YORK KNIFE CO.

MANUFACTURERS OF SUPERIOR

**Table & Pocket Cutlery,**  
WARRANTED TO BE MADE OF THE BEST

MATERIAL.

WALKILL RIVER WORKS,

Walden, Orange Co., New York.

THOS. J. BRADLEY, President.

F. W. HARROLD,  
Birmingham and Sheffield,  
ENGLAND.Importer on Commission  
OF  
HARDWARE, CUTLERY, GUNS, &c.W. SANDERS, Agent,  
76 Reade Street, N. Y.

## Manufacture of Peat Steel.

The business of carbonizing peat is day by day increasing, the resulting material furnishing an excellent fuel suitable for use as a substitute for charcoal, to which it is greatly superior with regard to cheapness and calorific power. An additional application of it is now proposed by Count G. F. de Douhet, of Paris, who suggests a series of processes for the utilization of the carbonization of peat, and of the agglomerations made by means of pitch and tar (except coal) for the purpose of cementing or converting into steel at a low temperature and in a few hours ordinary soft iron rolled, forged or in scrap by an entire novel method of cementation. He remarks that the greater number of manufacturers who devote themselves to this carbonization are so anxious to obtain rapidly and easily this valuable combustible that instead of collecting the chemical sub-products with which the distillation or carbonization of the peat would furnish them abundantly in closed vessels, they prefer to abandon them, limiting themselves generally to the retention simply of the ammonia by an elementary treatment of peaty vapor in a vat with a suitable quantity of sulphuric acid. But with regard to those light, tarry matters, such as paraffin and volatile and heavy oils almost fit for lubrication, but requiring careful extraction, the manufacturers neglect them, preferring to lose them in the atmosphere in carrying on the carbonization in a very crude manner—that is to say, in furnaces sufficiently open to permit the ready escape of the peaty vapors and bring about the carbonization by the simple movement of the incandescent matter in vessels more or less closed. But though it has been hitherto considered of but slight utility to collect the sub-products of the carbonization of the peat, it, however, becomes desirable not to lose them if they can be made to serve in the state of vapor and gas superheated to the degree usually allowed by this carbonization for new and important applications.

It has long been known that if soft iron heated to a bright red color is immersed in a solution of ferrocyanide of potassium it immediately acquires the hardness of steel. The same phenomenon is observed in passing the crystals of this salt over the surface of white hot iron, nevertheless this "steelification," for it is one, only exists at the surface of the metal, but it is none the less true that it will transform the iron into veritable steel if it is caused to enter ultimately into its molecular constitution. A steelification of the same kind is obtained by submitting iron at a white heat to a current of carbonated hydrogen and ammonia, which, moreover, but for the hydrogen would reproduce the two elements of cyanogen.

It is not necessary to describe the divers processes of steelification, either by the decarbonization of cast iron or the numerous methods tried lately in the laboratory or factory. It is sufficient to understand that in the existing state of the manufacture of steel there is in the diverse definitions of this product such confusion that it may be said each manufacturer possesses his own particular cement, which is always superior to that of his neighbor, and that one single truth is apparent in this chaos—that steel is only soft iron hardened, for which hardening there are many processes, all of which tend to cause the absorption by the iron of a tenth part of its weight of carbon, a hardening, however, only manifest in the tempering which then renders the metal proof against the action of a file. Be that as it may, it is certain that vapor of peat contains in abundance at the moment of its distillation in closed vessels, or of its carbonization in vessels, more or less carbonized hydrogen, ammonia gas and peculiar volatile and lubricating principles essentially adapted to serve as a vehicle for the assimilation by the iron of the desired quantity of carbon. If he submits to the action of these divers agents and to a temperature relatively low ordinary soft iron in bars of various sizes, he obtains in a few hours a steelification constant and sufficient to transform this iron into commercial steel.

The novelty of this process does not, therefore, consist, as will be seen, in the cementation of iron by the action of the gas and chemical agents specified; neither would there be any novelty if the cementation of the iron followed the usual process. The process comprises a calcination in closed vessels in refractory boxes of bars of iron mingled with charcoal hermetically sealed, and subjected during a long and sustained action for a number of days in special furnaces heat to a very high temperature, an operation naturally long, costly, and not in any respect resembling this process. In the latter the cementation of the iron takes place simply in the middle of peat, carbonizing itself in ordinary furnaces for producing its special charcoal.

All the ordinary furnaces employed in the carbonization of peat are, therefore, good and sufficient for this transformation of iron into steel, such as muffle arranged contiguous to each other, and in stages such as are employed in the manufacture of all kinds of agglomerations, especially the prepared charcoal known as *carbon de Paris*; also open furnaces, which may be closed when the carbonization appears sufficient, or those that close themselves gradually, or effect the carbonization of the peat by a continuous movement, and all furnaces employed in peat works where this carbonization may be effected by placing iron bars in the peat at the moment of their carbonization, thus producing the proper degree of steeling, provided the operation is prolonged or renewed more or less according to the thickness of the bars to be steelied by fresh layers of peat, continuing by their carbonization the steeling of the same iron. The iron cemented in this manner furnishes an excellent steel suitable for all uses, and a peculiar feature of this invention is the obtaining of this result at a low temperature by the processes described. Another fea-

ture is the cementation of iron in closed vessels by the dust of the ordinary agglomeration of *carbon de Paris*, or of green peat with the addition in variable proportions, according to the rapidity of the effect to be obtained, of yellow or red prussiate of potash in powder (cyanoferride and cyano-ferrite of potassium). In this case the cementation may be effected in closed or tight vessels or boxes, such as are ordinarily used for the cementation of iron, this process, known only in laboratories, not having been yet practiced commercially.

These directions are equally applicable to the steeling of iron by the carbonization of agglomerations by means of tar or pitch. It is easy, in fact, to understand that instead of peat he may employ these agglomerations at the moment of their carbonization for producing effects of steelifying nearly equivalent. In applying the method above indicated, it is apparent that among the furnaces for carbonizing that used in the manufacture of artificial charcoal, called "Paris charcoal," affords certain advantages. In fact, when the molded charcoal, still wet with its tar or pitch, is introduced into the muffle contiguous to and arranged one above the other, as in these furnaces, it is easy to place therein bars of soft iron of the length of the setting boxes in the middle of the bricks or cylinders of molded charcoal, so that with a single operation he may have when the muffle is charged a quantity of iron to steelify proportionate to that of the charcoal to harden and carbonize by the firing of the muffle, which eliminates the tar in reducing the same to the state of combustion by the hardening of the mass. When afterward the operation is finished, and the whole of the charge is deposited in the extinguishing pans, the iron bars follow the movement, and remain till cool in the same extinguishing pans or presence of the incandescent charcoal, extinguishing themselves gradually, and permitting the iron to be penetrated very perceptibly with the agents, whereby it is brought to the condition of steel. If, on the contrary, it is desired to effect the carbonization of peat in the same furnace, bars of iron may be placed nearly the entire length of the muffle, taking care to first cover its hearth with a layer of green peat. The iron in this state should be placed with the bars side by side flatwise, or better still edgewise if the bars can be held in this position, taking care that at the side of the door from which they should be taken the end of the bars project over the peat sufficiently to allow them to be first raised with tongs before taking out the contents of the furnace.

The furnace is then discharged, and the hearth quickly recharged, placing in the same manner the bars still red in the middle of the fresh peat; and in this manner he obtains by numerous successive operations, according to the thickness of bars, a very good steel, which if it is immediately hammered and redned equals in value the steels of Germany with regard to its facility in forging and welding; while in its rough condition, as it comes from the furnace, it may be employed directly for all the uses of steel, as for files, blacksmiths' work, cutlery and the like. The arrangement of furnaces with closed neck cylinders or closed vessels, for the purpose of collecting the sub-products of peat, would probably be still better if it were possible to withdraw therefrom the bars, and to renew the charge of peat as easily as in the process above described. Nevertheless, though this arrangement may be an excellent one, perhaps the first is preferable. He employs an apparatus for placing the bars, and keeping them edgewise and side by side in such a manner that they will not be reversed during their conversion into steel. This apparatus is composed of two strong iron bars of a length equal to the width of the muffle. These bars have notches sufficiently wide and deep to hold edgewise the iron placed therein for conversion into steel. One of these large bars is placed at the entrance of the furnace, and serves to support the iron. The other is arranged at two-thirds the length of the muffle to sustain rigidly by means of corresponding notches the iron bars, which are thus placed longitudinally edgewise, and side by side. Thus constructed, the said apparatus forms a species of grate with movable bars, and which is placed immediately over the hearth of the furnace.

The apparatus is left in the muffle during the time necessary for the steeling to take place, care being taken not to disturb it in depositing the peat. But it is sometimes advantageous to turn the bars after this deposit, so that each part to be steelied may be in turn covered by the entire thickness of the peat which forms the new charge of the muffle. The steel resulting from the employment of this apparatus is said to be more equal in its constitution than other steel. If it is desired to steel the scrap and ends of iron, which in the trade are sometimes termed ribbons, they may be thrown by shovelfuls into the muffle in the middle of the charge, and then emptied into the extinguishing pan till the mass is cool; then at the moment of the sifting of the peat the iron in fragments is very easily separated therefrom, to be submitted to such calcination as is necessary to convert it into steel by means of fresh charges of peat to be carbonized in the same muffle. Of course, these fragments of iron thus converted into steel cannot be utilized except as cast steel; nevertheless, when transformed in this manner, they are worth much more than their primitive value. The coal at the moment of its carbonization—that is to say, when it becomes coke—whether in gas retorts as used for the purposes of lighting towns, or in specially constructed furnaces (without regard to retaining the gas) for producing the coke direct is as suitable as peat, and the agglomerations for conveniently producing steel from iron.

No special apparatus need be used; it is sufficient to place either in gas retorts, where they are charged with coal, or in coke furnaces, soft iron either rolled, laminated in bars, or in pieces, in order to transform it into steel either after one calcination or several calcinations of coke, according to the thickness of the iron to be transformed into steel. The same process of producing steel applies also to all agglomerations of coal and coke by tar or pitch; the iron placed with them at the moment of their calcination to harden them becomes evenly and rapidly transformed into good steel. It might be objected to this application of the carbonization of the coal, and of agglomerations that the iron would become changed by the sulphurous matters contained in the coal, but experiments have shown that the greater part of the sulphur remains attached to the coke during the carbonization of the coal, and that in all cases there is not a sufficiently free liberation of sulphurous gas to alter the steel producing action of the various hydro-carburets and the ammoniacal principles contained in coal in such abundance.

This invention also comprises the application of the carbonization of wood, branches, sticks or blocks, either in ovens or furnaces, in closed vessels or in heaps in forests, to the production of steel from iron, the gaseous principles in presence with carbon at the commencement of carbonization being favorable to the production of steel from iron. The steel-producing power from wood, however, is variable, and that in order to effect it quickly it is preferable to use resinous woods, such as are obtained from our coniferous trees, pines, firs, larches, cedars, junipers, and the like, and for other countries mountain broom and furze, but particularly the stems and fallen leaves of those plants containing heavy and essential oils, but always carbonized in vessels or apparatus more or less closed.—*London Mining Journal*.

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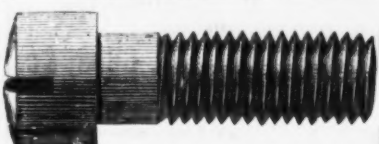
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### Decline of the Charcoal Iron Industry.

In 1854 the product of charcoal iron in the country was nearly half of the entire make of pig. To be exact, it was 46.4 per cent. From this point it gradually declined in the number of tons made, except in one year, and steadily in percentage of whole product until 1862, when the make was 186,660 tons, or 23.7 per cent., of the whole. From this date it gradually increased in number of tons made until 1873, when it stood 577,620, or a little over 20 per cent. of the whole.

In the meantime the seat of this industry has gradually changed, as will be seen from the following table, showing the charcoal pig iron product of 23 States in 1856 and 1874:

	Stacks, In 1856.	Make, 1856.	Stacks, Dec. 31, 1874.	Make, 1874.
Maine.....	1	2,100	1	1,601
New Hampshire.....	1	2,400	2	3,450
Vermont.....	5	8,904	5	17,777
Massachusetts.....	7	13,976	10	14,518
Connecticut.....	14	31,774	17	28,293
New York.....	6	2,100	39	40,978
Pennsylvania.....	150	96,154	14	25,003
Maryland.....	24	26,470	14	26,851
Virginia.....	39	14,828	41	26,851
North Carolina.....	3	450	8	1,340
South Carolina.....	4	1,806	9	4,370
Georgia.....	3	1,495	14	32,493
Alabama.....	41	28,476	18	37,327
Tennessee.....	30	36,563	33	36,644
Kentucky.....	54	70,855	37	92,855
Ohio.....	2	1,800	1	2,100
Indiana.....	2	1,900	11	49,093
Illinois.....	7	10,138	11	26,973
Missouri.....	3	2,500	11	26,973
Wisconsin.....	7	3,678	30	128,969
Michigan.....				
<b>Totals.....</b>	<b>439</b>	<b>348,854</b>	<b>2,951</b>	<b>576,557</b>

\* Including West Virginia.

The figures for 1856 are from *Lesley's Guide*, and for 1874 from the reports of Mr. Jas. M. Swank, Secretary of American Iron and Steel Association. These figures show at a glance two things: First, the transfer of the center of the charcoal iron manufacture from the East to the Mississippi Valley—the three states of Michigan, Wisconsin and Missouri alone making two-fifths of the charcoal iron made in 1874, and two-thirds as much as the whole United States in 1856. The second point is the largely increased capacity of the furnaces, 295 furnaces making two-thirds more iron in 1874 than 439 furnaces did in 1856.

But the fact of especial interest to which we will call attention is, that no locality can for any great length of time continue the manufacture of charcoal iron on a large scale. The figures we have given show this, and others of an earlier date would be even more conclusive on this point. For instance, Clarion, Mercer and Venango counties, in Pennsylvania, were once among the most productive regions in the United States for charcoal pig iron, having 73 furnaces. In 1859, 37 of these had been abandoned. To-day there is not a furnace in Venango county, not a charcoal furnace in Mercer, and but one in Clarion—the Madison, of J. P. Lyon & Co. From 1847 to 1849 the production of hot-blast charcoal iron declined from 94,519 tons to 58,302, a loss of 36,217 tons; and in the same time cold-blast charcoal iron fell from 125,155 tons to 80,665, a reduction of 44,490. In 1850 there was a still further decline to 42,555 tons hot-blast, and 70,727 cold-blast. By using these figures and comparing them with 1874, it will be seen that the production of charcoal iron fell from 219,674 tons in 1847 to 40,978 in 1874, nearly 80 per cent. The reason of this decline was in part the introduction of stonecoal pig iron; in part to the discovery of much richer ores, but also largely to the exhaustion of the timber lands. In some cases the furnaces were changed to stonecoal; but in many cases they were too far from coal or a market, or the cost of getting to market from the furnaces was too great to render it profitable to make iron any longer.

The same process seems to be going on at present in the Hanging Rock region of Ohio. The charcoal pig iron industry has probably reached its maximum development in this region. Timber is getting scarce, and has every year to be brought from a greater distance, thereby increasing the cost of the iron. This was not of much importance while the high prices of a few years ago were ruling, but now the altering of charcoal iron furnaces has led to numerous experiments in this region to adapt the stacks to stonecoal, of which there is, fortunately, an abundant supply near at hand. The first furnace to make the experiment was, we believe, the Hunnewell, in 1867, but the result was not satisfactory. It was soon after tried at the Star, and during the last two or three years almost every Hanging Rock furnace manager has burnt his fingers with stonecoal experiments.

The difficulty, as we have already hinted in these columns, has not been with the shape and proportions of the furnace, but generally with the blast and the way in which it was applied. Neither the volume, force nor heat that will be good practice in a charcoal furnace will answer with stonecoal. Indeed, the coke furnace men themselves have learned a good deal on this point during the past three years, and the most successful bituminous furnaces are those which have a large volume, high temperature and strong pressure of blast. The Isabella Furnace is, we believe, blowing through seven 6½ inch tuyeres, with probably 7 lbs. pressure, and at 900° F. temperature. We imagine that still better results would be obtained with superheated blast—say, 1400° to 1500° F., but of this we shall soon have an opportunity to judge, as the new Dunbar Furnace will be in a position to test it.

That the manufacture of charcoal iron should gradually be abandoned or crowded with the Indian and the buffalo to the forest-fringed borders of civilization, is inevitable. It is to be regretted, however, that the localities available for its cheap

production have grown so few in number and are so widely separated from each other and from the markets where that iron is needed. Probably neither coal nor coke will ever give us a substitute for it, but as it is an indispensable metal in many industries, we may expect that an increasing price will sustain a limited production long after the manufacture of a less valuable metal would have to be abandoned. We have fractured specimens of cold-blast charcoal pig iron under a tensile strain of 46,000 lbs. to the inch—the diagram showing extraordinary elasticity, and a toughness altogether unsuspected and scarcely believed until verified by repeated experiments. Such irons cannot be spared, and while a high price would restrict consumption, no metal now available can be substituted in its more important uses.

### The Influence of the Centennial on American Industry.

As we said in a recent issue, we believe that the effect of the Centennial Exhibition upon the industrial future of the United States will be permanently beneficial. In every respect it has realized all reasonable expectations, and while by no means complete in many departments, it has been of far greater interest, as showing the state of art and industry in this and other countries, than any previous exhibition. Its great benefit to this country results from the fact that it has been accessible to all classes of our people, and its influence as an educator of popular taste cannot be overestimated. During the exhibition more than 8,000,000 paying visitors have been upon the grounds, a number equal to one-fifth of our entire population. After making allowance for paupers, infants and other classes which do not belong to the producing or useful classes, and making deductions for those who have visited the grounds more than once, it is safe to estimate that at least 5 per cent. of the adult population of the country have seen the Centennial. As the rule, those who have been there have been just those who will profit most by the visit, and whose influence upon art, trade and manufactures will be the strongest. In the great cities of New York, Philadelphia, Boston, Chicago, Baltimore, Washington, Pittsburgh, Cincinnati, etc., the percentage of persons who have been at the Centennial is still greater. It is in fact evident to everyone who has looked into the matter, that the country has had abundant opportunity to see the Exhibition. The important point is what the effect will be.

In answering this question we cannot do better than compare the condition of this country with that of Great Britain before the great Exposition of 1851. This is our first great world's fair, as that was hers, and somewhat similar results may be expected. At that time the United Kingdom was almost without artistic taste. Decorative art was almost as bad as it could be, and Great Britain found herself the last of all European nations in art manufactures, while her works of taste, or requiring taste in their decoration, were so utterly lacking in beauty that they took no rank at all. France so completely overshadowed her that there was no comparison to be made between them. It was found that even a controlling commercial importance was not sufficient to offset the advantages enjoyed by continental manufacturers. Nothing short of an art revolution would save Great Britain's trade.

This country is not in quite as bad a position at the present time. Ten years ago, however, our position was very similar to that of Great Britain in 1850. Thanks to some of our far-seeing men, however, a reform was begun, and at the Centennial we find that our manufactures are much better than we had even hoped. We have what Great Britain did not have in 1851—an appreciation of good things. The best works sell better than the poorer ones; the most artistic decoration is most admired, and it is no longer possible to flood our markets with trashy things in the way of decorations. In fact, we have entered upon the second step of national art education. The Exhibition of 1851 did wonders for England. People learned there for the first time what was good and what was poor work. Aroused to the necessity of making their own work equal to that of other nations, they began a system of national art education. Museums were established in all directions; whatever was good, instructive, useful, or in any way contributive to the grand end to be attained, was purchased and placed on exhibition where the public could obtain access. Nothing was neglected. In more than one instance rooms were devoted to exhibitions of articles in bad taste, so that people might know how and why things were in bad taste. In a word, every effort was made to educate the public taste and cultivate a love of the beautiful. The principle was recognized that,

when the people know the beautiful, not only is a market made for fine work but the seed is sown from which true art may be expected to spring. In the course of only 17 years, England, from being lowest among nations as a producer of art work, stands at the head in the matter of artistic education, and has the best industrial art schools in the world.

We find ourselves very much in England's position, but we have now advantages infinitely superior to those which she had in 1851. A system of industrial art education has been devised, and is now introduced in several parts of the country. Museums are begun, and the people are awake. Our progress will be exceedingly rapid, since we have the world's experience to aid our progress. In art treasures the Centennial has given us what will be of infinite value to us. The Pennsylvania Museum of Industrial Art, the Boston Art School, and various other institutions of a like character, have secured some of the best works which have been upon exhibition. In fact, the cream of the articles exhibited is to remain in this country, and our designers, manufacturers and artisans will be able to study at leisure the best works from abroad. If the great show had done no more than this, it would have been an ample return for the effort made; but this is only a small part of the benefit. Those who could afford it bought and will take into their homes the beautiful things which best pleased them; those who could not, remember what they saw, and feel a want never before experienced, which already finds expression in a demand for better art work than our manufacturers have hitherto been able or disposed to give us. Their choice among articles offered them by tradesmen is already influenced by the recollection of what they saw in one department or another "at the Centennial." In other words, they have seen better and more artistic work and they want it at once. They cannot buy Doulton pottery, but they see no reason why the homestead ware should not have just as charmingly harmonious coloring. They cannot patronize the foreign house to get their curtains, but they cannot see why homestead draperies are not woven or printed with horizontal stripes. They cannot buy art hardware of English make, but they do not understand why a cast iron shelf bracket cannot be as satisfactory in form as are the foreign wrought brass brackets. The people are right. There is no good reason why they should not have the cheap goods they purchase beautiful and satisfactory in form. They may not be decorated very highly, or not decorated at all, but they may be beautiful for all that. We have seen plain heavy castings without an atom of decoration, which were beautiful to look at, beauty not being incompatible with the absence of decoration. In these inquiries for something better and more satisfactory, we find opportunities for the enterprising manufacturer. New wants have been created which must be supplied. This field is almost unlimited, since it will grow in proportion as it is filled, and grow so rapidly that, if proper care is taken, the progress of industrial art will lead rather than follow the development of public taste, and create new wants which are not recognized until the means of supplying them are provided.

### The Position of the Tin Markets.

The extraordinary reduction in the value of tin which was brought about early last summer, when the Netherland Trading Society resolved to meet the market with its accumulated stock of Banca, was well calculated to attract the attention of capitalists, dealers and consumers. After remaining for some months at bottom prices, speculators and the trade have co-operated to raise figures some 10 per cent. During the past three years the fluctuations to which the metal has been subject have been frequent and extreme, but the general tendency ruinously downward, and a sudden notable advance is at first received with considerable suspicion and hesitancy by bona fide consumers. That they should hesitate to anticipate their immediate requirements is quite natural, and they will not be likely to change their policy in this matter until assured that the causes which have given strength to the market are not wholly temporary in their nature and effects.

For a long time the Netherland Trading Society failed to recognize the fact that it was holding Banca tin above its intrinsic value. Instead of meeting the market and selling the metal for what it would bring, large amounts were withdrawn. As the consequence consumers all over Europe had recourse to the employment of Billiton, English, Straits and Australian tin, and the company's stock steadily accumulated. At private sale Banca was thus gradually borne down to within a guilder or half a guilder of Billiton, when at

length the society abandoned its policy, and its subsequent sales resolutely met the market.

The incubus of the company's stock thus ceased to prolong the uncertainty which had greatly contributed to weigh down the general tin market, the situation was eased by degrees under the stimulus of fair deliveries to consumption, shipments from the Straits and Australia slackened somewhat, and cheap money emboldened some speculators at London to operate more extensively for an advance. The success attending the speculation in copper came to their assistance, a revival in the metal trade seemed in immediate prospect, and tin sharing the benefit of these combined influences took a start, resulting in the recent improvement. This improvement, it is true, was temporarily checked by the war panic. It has held good since, and may make some further progress should the anticipations of holders with respect to free deliveries in the future be realized.

Statistically, the position of the metal had not improved materially up to the commencement of last month, as the following figures will show:

STOCK OF TIN IN EUROPE.				
	Jan. 31, 1876.	Oct. 1, 1876.	Oct. 1, 1875.	Oct. 1, 1874.
	Tons.	Tons.	Tons.	Tons.
Banca on warrants.....	1,113	1,299	335	877
Banca Trading Co.....	1,658	1,170	2,992	3,982
Billiton.....	875	951	919	1,010
Straits and Australian.....				
at London.....	6,088	7,912	5,595	2,658
	9,684	11,332	9,741	8,587

Price of Straits..... £20 £72 £86 £92

The lowest price since Jan. 1st was £70; the present price is £78.

There have to be added to the stock on the 1st ult. 795 tons Australian, still held in Holland, and the total visible supply will thus aggregate 15,705 tons, against 14,440 tons on February 1, and 13,772 and 10,835 a year and two years ago.

Advices lately received by cable report that the October deliveries have been unusually large, being 2121 tons, against 1459 in September, and 1510 and 1277 in September 1875 and 1874.

The shipments from the Straits show a noteworthy falling off, having been since January 1, 39,000 piculs against 47,000 in 1875 to this country, and 96,000 against 109,000 to England; together, 135,000 this year, against 156,000 in 1875, showing a deficiency of 21,000 piculs. As for Australia's output, one of the chief London tin authorities asserts the following in its last monthly report: "It may seem strange that the stream deposits of Australia should so rapidly show signs of exhaustion, whereas in Cornwall the stream works were for so many long centuries the source of the whole of the tin raised. But two things must be borne in mind: the tremendous pace at which the Australian tinners have carried on production, and the important differences in the conditions of the colonies as compared with our mining districts here. There are large districts of this mineral ground in Australia which cannot be worked because of the absence of water; and again, there are very large areas indeed of fairly rich stanniferous deposits which it will not pay to work at anything like present prices because of the high price of labor."

Whatever is brought forward in England respecting the Australian prospective yield during a period of speculation for a rise or a fall, must, however, be received with a grain of allowance. Australia, both on the main land and in Tasmania, has an enormous area of tin deposits, easily worked except in times of prolonged drought, and every year the product is more easily marketed as rapidly as railroad facilities are extended. If labor is dear in that colony the abundance of the mineral is proportionately greater and exhaustion is not feared. On the contrary, our table shows the amount actually afloat to be larger than ever before, if we except the early months of the present year.

The main points on which the immediate future of tin values will turn are the maintenance of peace between the great powers of Europe and the revival of trade both in Europe and the United States with the advent of spring.

Our own market is in a pretty fair condition so far as the statistics are concerned. Our stocks are notoriously reduced both at the ports and in the interior, and there is comparatively little tin on the way. But there are no signs yet of any serious revival in our metal market. We are close upon the dull spell of the winter months, and need not look for much of an improvement in the metal markets until the month of March next.



## Business Failures.

Whether or not such a thing as over-production is possible, so far as useful productions are concerned, there is no room to doubt that overtrading is possible, even in legitimate and necessary branches of business. For many years the commercial prosperity of the country has suffered from an overcrowding of many branches of business. Two houses have competed for a trade which one could have safely and profitably done, provided it had the capital of both to work with. This has been the rule rather than the exception in all the business centers of the country, and it is still the case to some extent in our cities. To this fact we may attribute a very large part of the failures which have occurred since the beginning of the war, with the exception of those resulting from the loss of Southern trade and the impossibility of collecting Southern debts. Mr. Abraham S. Hewitt has been at the trouble of compiling the statistics of failures in the United States for a series of years, and has given the public the totals, which are of interest as affording opportunity for comparison:

	No. of Failures.	Amount of Liabilities.
1863.....	1,632	\$23,049,000
1864.....	495	7,899,000
1865.....	530	17,625,000
1866.....	1,305	53,793,000
1867.....	2,740	36,568,000
1868.....	2,608	63,094,000
1869.....	3,799	75,054,000
1870.....	3,546	89,342,000
1871.....	2,915	85,252,000
1872.....	4,069	121,058,000
1873.....	5,183	228,499,000
1874.....	5,830	155,239,000
1875.....	7,340	201,090,000
1876 (nine months).....	7,060	156,378,000
Totals.....	49,222	\$1,381,809,000

It will be seen that, while the number of failures in 1873 was fewer than during the two years succeeding and the nine months of 1876, the amount of liabilities was considerably greater than it has been before or since. This is explained by the failure of the great banking houses, and the collapse of certain unsubstantial railroad schemes which represented a large aggregate investment of misapplied capital. In the other years we find a gradual steady increase which, we imagine, bears some relation to the number of persons or firms engaged in business. If we had the data on which to base a calculation, we think it would be found that the percentages did not greatly vary from year to year in the number of failures to the number of individuals or firms in business, but that the amount of liabilities reported from year to year increases in a ratio more than proportionate to the amount of capital invested in business. In other words, there are too many men operating largely without adequate capital, and owing to the close competition in almost every line of mercantile business, the large expenses necessarily incurred, and the small margin of profit which it is possible to realize upon merchandise, there is a constant temptation to speculative ventures which cannot be safely made. As the consequence, thousands fail annually, and their aggregate liabilities range among the hundreds of millions. Perhaps these are among the inevitable conditions of commerce. We have no doubt they are at present, and probably they will remain so until the fact is more generally appreciated that production is the only source of wealth, and that commerce is merely the agency by which that wealth is distributed. During the past few years it has been scarcely more than an agency for distributing the losses resulting from the shrinkage in values. Much of this shrinkage is due to overtrading, since we should not in all probability have had such an accumulation of commodities in the market had not the condition of business compelled merchants to buy and carry larger stocks than they could handle, and to incur obligations to manufacturers and producers which overtaxed their strength.

If experience has taught us anything, it is that the time is past when a large business could safely be done on small capital. The margins of profit are too small, the competition too sharp and the risks too great. Such ventures may succeed, but the chances are decidedly against them. Columbus twice crossed the Atlantic in vessels which were but little more than open boats, and the Empress Eugenie, in her flight from France in a pleasure yacht, weathered the storm off Cape Finisterre which swamped the "Captain." The same thing can be done again under like conditions, but the requirements of safety and profit in ocean navigation demand staunch vessels of large capacity and considerable tonnage. If we send a fleet of sloops and fishing smacks to sea, we may reasonably expect that a good proportion of the number will go down in storms which strain the timbers and snap off the masts of great ships. If every year 5000 or 6000 business houses set out without sufficient buoyancy to carry their load, we may expect that a very large proportion of them will go down in the first heavy weather they encounter.

## Taxing Samples in Canada.

Advices from Canada report that the responsible authorities of the Dominion Customs Department have directed that hereafter all samples of merchandise brought into the country by commercial travelers shall pay the full duty as imports, and that no drawback shall be allowed when such samples are again taken out of the country. It is stated that duties are to be collected only when samples "are of commercial value," but this qualification means practically nothing, as everything in the shape of merchandise has commercial value. This is a fact which it is important for those engaged in Canadian trade to remember. As a measure of revenue it will yield but little, and all that can be said of it is that it is a petty injustice to those who have occasion to send samples across the border. However regarded, it is a very small policy. It will afford no protection to Canadian manufacturers, and will only impose a two-penny tax on commerce which, in the end, will be paid by Canadian traders. The Canadian market belongs to the manufacturers of this country until such times as the manufacturers of Canada can afford to claim it for themselves. At present they are not in a position to do so, and will not be until the country has a much larger population, and has more fully developed its somewhat limited natural resources. The Canadians are not a people whose enterprise takes the form of industrial activity. There is plenty of iron and coal in the Dominion, but during the past three years American iron and steel to the value of something over \$13,000,000 have been consumed in Canada.

## Politics and Business.

The excitement of the national political canvass and the uncertainty which still attends the result of the election, so far as the composition of the Electoral College and the choice of President are concerned, have exercised a very hurtful influence upon all branches of business. We usually expect that the years in which presidential elections are held will be bad years for business, but under the general conditions which now exist, the fact that the course of recovery from extreme depression has been so seriously interrupted, is certainly greatly to be regretted. We can, however, console ourselves with the philosophical reflection that, if the time has come and the conditions are favorable for a return of industrial and commercial activity, the temporary interruption will not change the general tendency. The opinion that the country is safe, whichever way the vote of the doubtful states is cast, seems to be entertained by all classes of the community. After the heat of the contest has subsided, and we have had time to consider the situation calmly, it becomes evident that neither party has, nor can have, power to make any changes in the policy of the government which can unfavorably affect the welfare of the community at large, or cripple the industry and commerce of the country. Most thoughtful persons admit that a very even balance of political power between parties is favorable to good government, and that it makes but little difference on which side of the line the majority lies, so long as the minority is strong enough to hold it in check and in a position to profit by its mistakes. Until the issue is decided, however, we cannot expect that men will give their minds to anything more practical than political discussion. When there is no longer anything more important to discuss than the wrangling of the animals in the Congressional bear garden, we may expect to see a quickening impulse in trade and, before another year is fairly begun, a decided progress in the direction of recovery.

## Philadelphia's Permanent Exhibition.

In preparing for a permanent industrial exhibition on so extensive a scale as is now contemplated, our Philadelphia neighbors propose a bold, but not unpromising undertaking. The Committee on Organization have taken hold of the project at the right end, and with a determination which promises that their part of the work, which includes the raising of a fund to purchase Machinery Hall, will not fail of success. In a circular issued a few days ago for the information of the public, the committee say:

Notice of application for a charter has been given for a new company, to be called the "International Exhibition Company," of Philadelphia, with a capital of \$600,000, divided into 6000 shares of \$100 each. Subscriptions will be received to the stock as follows: Payable in cash, as called for by the board of directors to be appointed by the stockholders; payable by transfer of the stock of the Centennial Board of Finance, the stock of the International Exhibition Company being issued at par for the actual cash that may be realized. Subscriptions to the maintenance fund can be made in cash, contributors being entitled to a season ticket for the year 1877 for each \$10 contributed in stock of the Centennial Board of Finance, contributors being entitled to a season ticket for 1877 for every two shares, or to 30 single tickets.

of admission for each share. In all cases of transfer of stock, the present owners may retain the memorial certificate of the Centennial Board of Finance.

The people of Philadelphia, having enjoyed so long the pleasurable and exhilarating excitements of the Centennial Exhibition, are just now in a frame of mind well calculated to inspire them with enthusiasm in favor of a permanent exhibition. Enough has already been secured to insure the success of the enterprise, so far as securing the building is concerned, and the committee announce that, up to the 10th inst., they had received from over 600 Centennial exhibitors applications for space. Philadelphia could get up a very extensive and interesting exhibition of local manufactures, and it cannot more worthily and successfully perpetuate the glories of the Centennial than by thus continuing it on a scale within the means of her people.

## New Publications.

AMERICAN HANDBOOK OF INDUSTRIAL DRAWING, for Schools and Home Instruction. A simple application of practical geometry to the daily wants of the mechanic and artisan, with a complete explanation of the use of instruments as applied to architectural and mechanical drawing. By C. A. Emery. Part I. Springfield, Mass. Milton, Bradley & Co., 1876.

So great is the importance of art education as a means of raising the standards of excellence in all departments of productive industry, that we welcome any addition to the elementary literature of the subject. There are throughout the country thousands of young men, mostly apprentices in the various manufacturing trades, who would gladly master the difficulties of mechanical drawing if opportunity offered. They cannot find anyone to teach them, and they do not know how to teach themselves. The difficulty is in making a beginning. This removed, any intelligent and industrious young man could with a drawing board and a few inexpensive instruments soon learn how to express his ideas in what is peculiarly "the language of mechanics." It is this elementary knowledge which Mr. Emery aims to give in the first part of what promises to be a valuable series. It is a primer of mechanical drawing, intended for the use of the practical mechanic and useful to him. It is written in simple language with an avoidance of unnecessary technical terms. Many things are described in detail which are very simple to the practical draughtsman, but it is just this which gives it value for the beginner who desires to become practical. It describes the necessary drawing instruments, and not only explains their use, but tells how to use them. It does not lead the student into any needless extravagance in this matter. The instruments recommended are such as the draughtsman needs from the beginning, and the student who follows Mr. Emery's advice in this matter will have no occasion to feel that he has been led into a foolish extravagance in buying fancy instruments which he does not know what to do with. The geometrical problems, which form the initial step of the progressive system of study, are well chosen, and involve combinations of lines which are needed every day in the shop. The four parts of the complete series comprise the following range of instruction:

Part I. Drawing materials; use of drawing instruments; explanation of practical geometrical problems necessary in laying out the various plane figures used by carpenters, builders, machinists, ornamental painters and decorative artists; the application of the T square and triangle to practical drawings.

Part II. The elementary principles of projection as applied to the representation of objects with three dimensions, and the intersection and development of surfaces as required by the architect, engineer, boiler maker, tin and copper smith and stone mason, with practical illustrations.

Part III. Finished drawings of machines, buildings and engineering works, including plans, elevations, shading, lettering, &c.

Part IV. The theory of mechanical motions, and the practical construction of cams and gears; principles of bridge building and roof trussing; surveying without instruments.

The value of such a work depends, of course, upon the manner in which it is done. Fortunately, Mr. Emery is fully competent to teach the art of mechanical drawing. He is a practical mechanic and draughtsman, employed in the United States Army at Springfield, Mass., and has for a long time taught successfully an evening class of mechanics and apprentices. We know this gentleman through the excellent work of some of his pupils, and we cannot give the mechanics and apprentices who read our pages better counsel than to advise them to procure Mr. Emery's manuals and study them carefully. The art he teaches must not be confused with industrial drawing for art purposes. It is strictly mechanical, but the mechanic will find a knowledge of its principles a great assistance in pursuing his studies into the higher realm of decorative art. Parts I and II will furnish abundant and profitable employment during their long winter evenings, and the mechanic who will follow Mr. Emery's progressive system, step by step, with conscientious fidelity, will be a better workman before spring than he could hope to become by any amount of mere shop practice. The worker in sheet metal would especially profit by such study, and its interest is great enough to attract those least inclined to the labor of self-improvement during the hours available for recreation and rest.

RAND'S BUSINESS DIRECTORY OF NEW YORK CITY for 1876-7. Price \$1. Walter Hough & Co. No. 14 Park Place, N. Y.

The utility and convenience of this little work will be understood by all classes of business men, and especially by retail dealers buy-

ing in the New York markets. It contains what claims to be a full and complete list of the importers, jobbers, manufacturers and dealers in specialties in New York city, classified and arranged in systematic and alphabetical order by trades and occupations. So far as we can tell from such examination of the work as we have had time to make, this claim is made good. The work contains 240 pages, 5½x3 inches, with an elaborate index. It is handsomely printed on good paper, ruled pages, and is substantially bound in English cloth, with gilt embossed title. It will be found useful to merchants, manufacturers and others having business relations, correspondence, etc., with the great metropolis, as they have at hand always a ready reference work giving the business, exact style of firm, name, street and number of address. It is a great deal cheaper than any business directory previously issued, and seems to lack nothing essential to its completeness and value. It is not interlarded with advertising, and in every way seems to be all that the publishers say it is, "a reliable and complete business directory of New York, issued at a low price."

## Merchant Iron at the Centennial.

(Continued.)

THE ALLENTOWN ROLLING MILL CO. exhibit in the Main Building, in connection with the collective exhibit of the Lehigh Valley, samples of the products of their mines and rolling mill, including flux, iron, slag, light and heavy rails, fish plate, bolts, nuts, spikes, rivets, etc. The first rolling mill of this company was a small affair, built in 1860, and devoted exclusively to the manufacture of T rails until 1871. Since that time several establishments have been bought and others built, until the works is one of the largest in the country, and the range of iron work done embraces nearly every description of cast and wrought iron work.

WICK, RIDGEWAY & CO., of the Valley Rolling Mills, Youngstown, O., make an exhibit of railroad iron, both of heavy and light sections.

VALENTINE & CO., of the Logan Iron Works, Bellefonte, Center county, Pa., exhibit at Q 61, samples of their cold-blast charcoal pig, and also of articles made from the same. The display, though small, contains some very fine iron, and seems to justify the high reputation it has gained.

WILSON, WALKER & CO., of Pittsburgh, Pa., show at T 66, Main Building, various forms of railroad supplies, such as draw bars, links, pins, buffers, fish plates, truck rollers, hammered and rolled axles, and railroad forgings generally. This firm make a specialty of draw bars and Miller hooks of all shapes, making probably the most complete assortment of any firm in the country. In addition they make universal mill plates, angles, shafting, merchant bar, &c.

THE AMERICAN SHEET AND BOILER PLATE CO., of Cleveland, O., make their exhibit in connection with that of the Cleveland Rolling Mill Co., at T 66, Main Building, the display consisting of sheet, both black and galvanized, and boiler plate. Samples of their galvanized iron are also shown, stamped and corrugated, the latter for roofing, of which they make a specialty. The capacity of these works was largely increased in 1873, and in addition to the usual machinery it has the largest corrugating machine in the world, capable of corrugating iron to a width of 5½ inches and working a sheet 9½ feet long.

THE POTTS TOWN IRON CO. make a very fine display of their products at B 24, Machinery Hall. Beginning with their ores from Hopewell, showing by analysis 57.895 per cent. of metallic iron, 20.811 per cent. of earthy matter, 0.415 per cent. of sulphur, and 0.056 per cent. of phosphorus, they exhibit pig, muck bar, nail plate, boiler and ship plates, nails, light rails, chain, etc., as well as a self-feeding nail machine. The samples of muck bar are very good, the tests to which they have been subjected being of such character as to show the quality of the material. One piece is split up the center lengthwise of the bar, and while one side is bent cold into a volute, the other is drawn out hot into a whip-lash shape and twisted, the two tests showing the neutral character of the iron. A large ship plate is shown, marked tensile strength 45,000 pounds, and pointed on it is a list of ships which have had plates from these works, the list being quite large and including some of the most noted of the recent iron ships. The works consist of a blast furnace, rolling mill, plate mill and nail factory containing fifty-two nail machines. The plate mill has a capacity of 6000 tons per annum, the nail factory 125,000 kegs, and the furnace 10,000 tons, the whole works giving employment to five hundred men.

POTTS BROS.,

Pottstown, Pa., exhibit at B 24, Machinery Hall, samples of boiler plate, flanged and skelp iron made into tubes. A section of one of these tubes is shown hammered down to show the strength of the weld, it not starting in the least. This firm make boiler, tank, flue and pipe iron, and have at annual capacity of 3000 net tons.

THE PINE IRON WORKS, Joseph L. Bailey & Co., Berks county, Pa., is one of the oldest rolling mills in Pennsylvania, having been built in 1846, and making plate iron from blooms. This brand is also one of the best known in the country for its superiority and uniformity, and it is stated that a large portion of its production is permanently engaged by locomotive and railroad shops. The samples shown certainly indicate a very superior iron. One small piece is drifted five times and in almost every imaginable shape—round, oblong with the grain, a half round hole across the grain, and one very large round hole nearly the whole diameter of the piece.

## THE GLASGOW IRON CO.

is in ownership and management the same as the Pine Iron Works, noticed above, but a somewhat different line of iron is made at Glasgow and in a different way, the Glasgow works having puddling furnaces and the Pine none. At the Glasgow works, in addition to tank and boiler plate iron, muck bar, boat plate, girder and bridge iron is made. The muck bar tests are very good, showing a strictly neutral and tough iron. A C. H. No. 1 plate is shown 82 inches diameter by ½, with tensile strength marked 60,000 lbs. Another boiler plate 240x80x½, 50,000 lbs. tensile strength. The capacity of the mill for boiler heads is up to 90 inches.

THE DUNCANSON IRON CO.

have a nail machine in operation in Machinery Hall, and also show a large sample card of their various sizes of nails.

THE PENNSYLVANIA TACK CO.

make a very attractive and noticeable display of tacks and tack machines in Machinery Hall. The almost endless variety of tacks, brads, shoe nails, etc., which constitute the assortment of the manufacture of a large tack factory, are shown in drugstore bottles on shelves in rear of the display, their different colors making it quite attractive. In front are a number of tack machines in operation, a sign stating that they are Weaver's patent machines, making 400 tacks per minute, and over 2500 different kinds and sizes.

BROWN, BONNELL & CO.,

of Youngstown, O., exhibit, in the Mineral Annex to the Main Building, samples of their product from the pig to finished iron. This is the most extensive works in the Mahoning Valley, and has grown from a capacity of 4 tons daily in 1855 to 100 tons of finished iron at the present time. All grades and kinds of merchant iron and sheets are manufactured, as well as nails, boat and railroad spikes.

THE YOUNGSTOWN ROLLING MILL CO.

exhibit at V 61, Mineral Annex, in connection with the Mahoning Valley exhibit, samples of horseshoe, bar, hoop and band iron and steel mixed iron.

## Information for the People.

The following is one of the humorous incidents of the Centennial: Among the places of popular resort for sight-seeing in the Centennial Exposition, none rivaled the glass works, except, perhaps, Memorial Hall. The inquisitiveness of the visitors is often annoying and embarrassing, as well to the workmen as those who have charge of the objects for sale. One curiosity is a glass bonnet, a real "love of a bonnet," too, which is an object of unceasing wonder and admiration, and provocative of thousands of questions concerning its construction. The work people seem at last to have grown weary of answering questions, and resorted to a printed placard which is posted close to the bonnet. And this is the way it runs:

"Is it a hat? No.  
"Is it a bonnet? Yes.  
"Is it glass? Yes.  
"Is it silk? No.  
"Are the strings glass? Yes.  
"Is the lining glass? No.  
"What is it? Silk.  
"Are the flowers glass? Yes.  
"Was it made here? No.  
"Where, then? Boston.  
"When was it made? Last summer.  
"By whom? The Woodroffes.  
"How long did it take? Four weeks.  
"Was it woven while the glass was hot? No.  
"Is it flexible? Yes.  
"Is it lovely? Yes.  
"Can any one wear it? Yes.  
"Will it break easy? No.  
"Can you pack it up? Yes.  
"Isn't it the latest style? Yes.  
"Is it sold? Yes.  
"How much was it? One hundred and fifty dollars.  
"Oh, my!  
"Any other questions pertaining to the bonnet will be cheerfully answered by Mr. Brown."

## Ice Boat.

The Canadians are building, and will finish in November, a novelty in marine architecture. It is an ice boat; not intended, however, to be used upon the ice but for breaking it up. She is to be employed in keeping the St. Lawrence River open from Quebec down to Prince Edward's Island. She is sheathed in greenheart, an exceedingly hard wood, and this, in turn, is sheathed with iron. She draws 17 feet of water aft, and has a comparatively small propeller, which has 5 feet of solid water over it at all times to prevent it from getting fouled by ice. It is stated that her engines are 700 horsepower, nominal. According to the usual estimates of the ratio between nominal and actual horse-power her engines would be enormous; larger, in fact, than those of most ocean steamers. The hull is especially designed so as to prevent being "ripped" by the ice. The ice upon the St. Lawrence is very heavy and forms an impenetrable barrier to navigation, yet it is by no means improbable that if steamers were kept at work in the river breaking up the ice and hindering it in becoming solid throughout the extent of the river that navigation might be kept up through the winter months. In New York and other harbors on our coast the ice was in former times not unfrequently so thick that no vessel could get through it. The introduction of steamers, their constant motion to and fro, preventing the formation and breaking up the masses, has completely prevented the closing of our northern harbors by ice for many years. Our older readers may remember that New York and Boston harbors both had at one time, breaking boats, but, as the number of steam tugs and ferryboats increased little use was found for them in breaking ice.



Any Dealer is aware that in an ordinary Hand Saw, the front cut is the effective cut, and drawing back the Saw has little effect, by reason of the slant edges riding over the fiber as the Saw is drawn back. The difference between the front cut of a Hand Saw, and the back cut, is the difference between the Lightning Saw teeth and all others; for all other saws are set one point and ride on slant edges. By setting two points of my M the same side, and the next two the other, I conceal the slant between them, and operate wholly by the outside of a nearly vertical M tooth. Standing nearly vertical the two points of the M occupy the same space as one old V tooth. One point only is cutting and the other follows in the slit behind it to cut in the same manner, in the return motion, thus doubling the cut upon the same base and space of tooth. This construction also gives the breadth and durability of nearly an inch of steel instead of a single slender scraping point, and presents the upright instead of the slant edges to the timber. Any one can in a moment test the principle by comparing the front and back cut of any V tooth Hand Saw. My new Patent of March 28th, 1876, allows the saw-dust perfect clearance; the arch slightly widening to the points of teeth renders it impossible for green or resinous saw-dust to be retained, while the slightly increased breadth at base of tooth gives the durability so much advocated by parties who have round-edged files for sale. Slightly pyramidal, the outer edges are as upright as the front cut of a Hand Saw, and the back slant cut is concealed in no other saw than mine, by setting the two points of M to cut in line instead of alternately. Thus by this new patent I avoid all "overhang or undercut," avoid all tearing, and to the matchless speed of the Lightning dress and set, add the durability, simplicity of sharpening, and sweet cutting so much admired. I thus adapt the Lightning teeth to universal use, in all Hand, Pruning, Buck, and Cross-Cut Saws. The concave in the centre of the M saves files, and renders it impossible to file the tooth out of shape. A 10 inch Cant File and Set fitting the M is furnished for forty cents, that will file ten saws easily.

A 16-inch log was sawed off in 17 seconds by hand with a Lightning Cross-Cut Saw, at Pennsylvania State Fair, on September 30th, 1874, before President Eby; W. B. Lawson, S. S. Hoagland, and other officers of the State Board, timing.

\$1000 challenge to any responsible saw manufacturer, to match the Lightning Saws, in speed of cutting and ease of sharpening. This patent saw tooth has recently been vindicated by U. S. Court decreeing cost and damages for infringements. Beware. POOR GOODS ARE NEVER IMITATED.

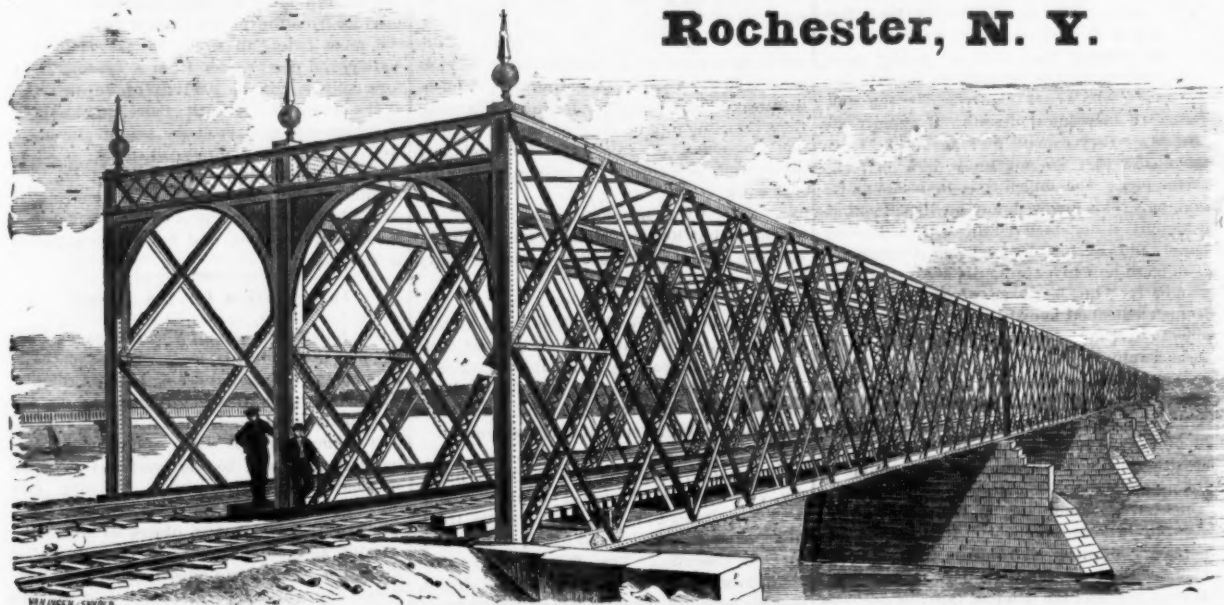


STORE AND WAREHOUSE, No. 80 Rockman Street, N.Y.

PHILADELPHIA OFFICE, near Corliss Engine, Machinery Building, Centennial.

**TRIAL OF THE IMPROVED LIGHTNING SAW.** The Emperor, Don Pedro, accompanied by Director-General Osborn, Superintendent Albert and others, visited Machinery Hall, at the Centennial, on the evening of June 28th. Among other things inspected, at the invitation of E. M. Boynton, of New York they witnessed a trial of the new Lightning Saw, patented March 28, 1876. Two men with one of these saws cut off a sound log of gum wood, one foot extreme diameter, in seven seconds, or at the rate of a cord of wood in five minutes. Messrs. Corliss, Morell, Lynch and other members of the commission witnessed the trial and timed the cutting. The Emperor remarked that was fast, very fast cutting. Last evening the Emperor made another examination of the saw. *Philadelphia Press*, June 30. Hoxton's saws were effectually tested before the judges at the Philadelphia Fair, July 6th and 7th. An ash log 11 inches in diameter was sawed off, with a 4x foot Lightning cross saw, by two men, in precisely six seconds, as timed by the chairman of the Centennial Judges of class 15. The speed is unprecedented, and would cut a cord of wood in four minutes. The Representatives of Russia, Austria, France, Italy, Spain, Belgium, Sweden, England, and several other countries were present, and expressed their high appreciation.

## LEIGHTON BRIDGE AND IRON WORKS, Rochester, N. Y.



Wrought Iron Riveted  
Lattice Railroad

AND

HIGHWAY BRIDGES.

Wrought Iron  
WATER PIPE.

The most economical and durable Pipe manufactured for Water Works, Oil Lines or Gas Mains.

General Riveted Work

Orders Solicited from Civil Engineers and Contractors.

[Accompanying engraving represents the Springfield Bridge, built by the Leighton Bridge and Iron Works.]

**SPRING PERCH CO., Bridgeport, Conn.**

Established 1843. Manufacturers of FIRST QUALITY

# SPRINGS & AXLES

And Beer's Patent Curtain Rollers, Concealed Hinges, Etc., Springs of any pattern made to order. Send for Circular and Price List.

**THE HARTFORD FOUNDRY AND MACHINE CO.,**

Successors to the  
**WOODRUFF & BEACH IRON WORKS,**  
Hartford, Conn.

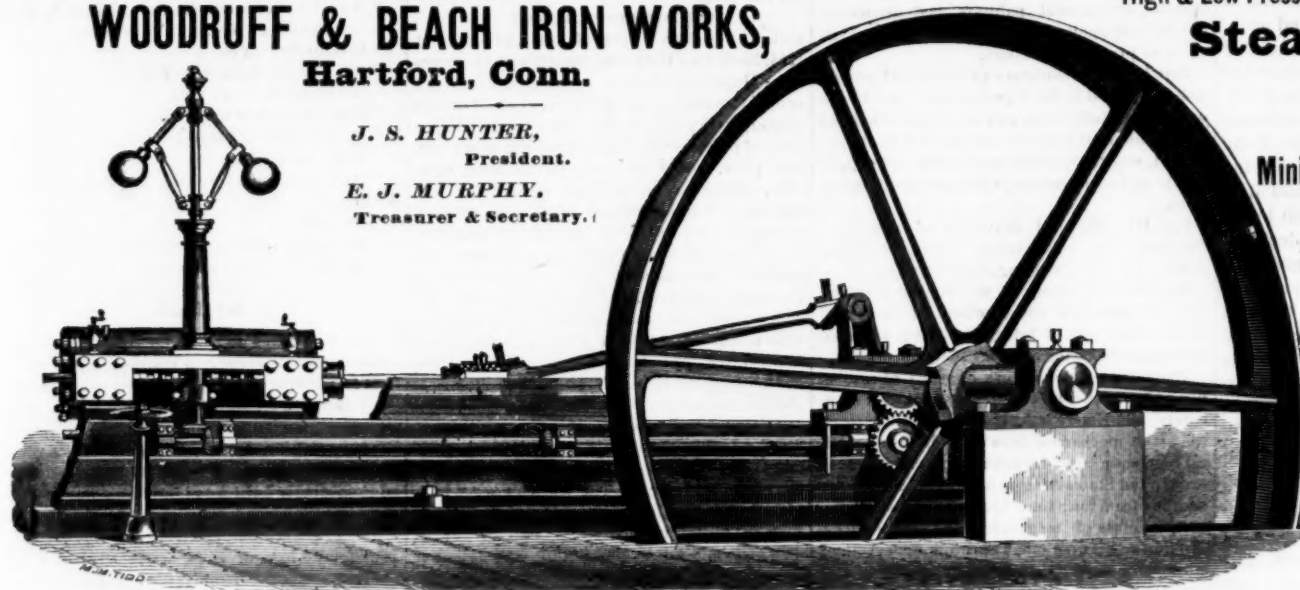
**J. S. HUNTER,**  
President.  
**E. J. MURPHY,**  
Treasurer & Secretary.

High & Low Pressure Marine & Stationary  
**Steam Engines**

AND

**Boilers,**  
Mining, Powder and Paper Mill  
**Machinery,**

And every Variety of Iron and Composition Castings made to order.



The following are a portion of the Engines manufactured at these works and are a sufficient guarantee of our capacity for doing first-class work, viz.: The Pumping Engines in the cities of Brooklyn, N. Y.; St. Louis, Mo. and Hartford, Conn., and in the Charlestown, Mass. and Norfolk, Va. Navy Yards, and the engines in the U. S. Steam Sloop of War Michigan, Kearsage, Manitou, Minnetonka and Pisataqua and the Gun Boats Cayuga, Pequod and Nipic, the Government Transports Dudley Buck and Geo. C. Collins, and the Steamships America and United States. Also the large Horizontal Engine for the new Plate Mill of the Bay State Iron Co.

**MALTBY, CURTISS & CO.,**  
Manufacturers of METAL KEY MAPLE AND ROSEWOOD FAUCETS.

Also Manufacturers of

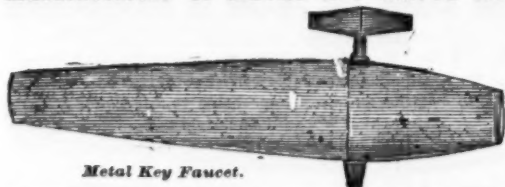
Capewell's Giant Nail Puller.

The Buell Peg Float

AND THE

Little Giant Tack Puller.

34 READE ST., N. Y.



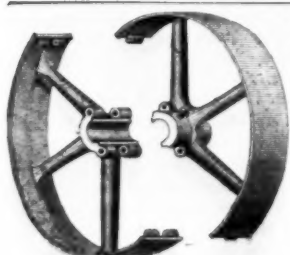
Metal Key Faucet.

**Split Pulleys & Split  
Collars**

Of same price, strength and appearance as WHOLE PULLEYS and WHOLE COLLARS.

**YOCOM & SON,**

Drinker St., below 147 N. 2nd St.,  
PHILADELPHIA, PA.



**Ludlow Valve Mfg. Co.,**

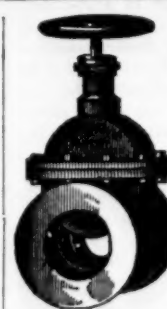
OFFICE AND WORKS:

938 to 954 River St. & 67 to 83 Vail Ave., Troy, N. Y.,

**VALVES**

(Double and Single Gate, 1/4 in. to 48 in.—outside and inside Screws, Indicator, &c.)  
for Gas, Water and Steam. Send for Circulars.

Also FIRE HYDRANTS.



**TACKS**

Manufactured by  
**BRIGHAM, LITCHFIELD & VINING,** South Abington, Mass.

of all kinds,

Made of Iron,

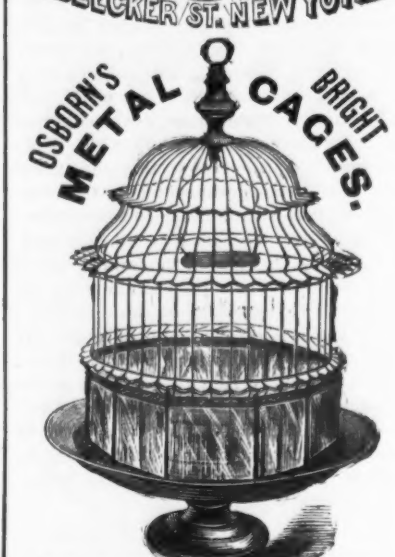
Steel, Zinc,

and Copper

of any size

or shape.

**OSBORN MFG. CO.**  
TRADE MARK  
BLEECKER ST. NEW YORK



The Original Inventors and Manufacturers of the  
**OSBORN BRIGHT METAL CAGES.**

Also OSBORN & DRAUGHTON Improvements under twelve different patents. We are continually bringing out new and beautiful designs to meet the demands of refinement and taste.

ALVAN DRAUGHTON, General Agent.

**JOHN MAXHEIMER,**

Manufacturer of

Japanned & Patent Eureka Bright Metal  
**BIRD CAGES,**

247 and 249

Pearl Street,  
NEW YORK.

FULL SIZE OF  
WIRE CONNECTION



Patented June 3, 1863;  
April 6, 1869; Dec. 23, 1873;  
Jan. 30, 1874; Dec. 22, 1874;  
April 20, 1875.

**C. RIESSNER & CO.,**

MANUFACTURERS,

No. 242 Pearl Street, NEW YORK.

"SUMMER QUEEN"

**Oil Cook Stove.**

FOUR SIZES.

Suitable for all purposes, for Cooking, Baking and Ironing.

NON-EXPLOSIVE.



We would respectfully call the attention of the Trade and Public to our Heating Drum, which, in connection with our Summer Queen Oil Stove or Centennial Gas Stove, is well adapted to heat small chambers, green houses, etc.

No Smoke. No Ashes.

**C. RIESSNER & CO.,**

242 Pearl Street, N. Y.

**Smith's Patent Improved.**



**THE BEST ADJUSTABLE HOLLOW  
AUCER MADE.**

Every machine is tested by actual work, and will easily make the whole range of work claimed. The Knives being sharpened and adjusted before leaving the factory, gives to the mechanic a tool ready for immediate use. The cut is for brace use; the size larger is used with a crank. For sale by

**CHAS. M. GHRISKEY,**

Manufacturers' Agent,

508 Commerce Street, Philadelphia, Pa.



## Low Cost Estimates on Pig Iron.

BALTIMORE, November 11, 1876.

To the Editor of The Iron Age—DEAR SIR: Your subscriber and business correspondent reading your journal of November 2, page 3, observes Mr. M. Taylor's letter of October 21, who designates a portion of Virginia and West Virginia where, theoretically, Bessemer pig can be made at \$12.51 per ton at furnace from certain ores assayed by Professor Genth, that blackband pig iron—American Scotch—can be made at Ganley River for \$9.23 per ton; that Mr. I. L. Bell, of England, reports that brown hematite iron ore deposits and veins 24 feet wide by 40 feet deep of 47 per cent. metallic iron from furnace abounds from Buffalo Gap, Augusta county, Va., to Covington, on Chesapeake and Ohio Railroad, but omits the all-important feature of cost of freight to Western markets. I am familiar with that section of Virginia and its furnaces, and the cost and quality of pig iron they produce, and whether they are a success or failure. Now I candidly state that I do not know of a furnace there that has or can run on Bessemer, Scotch American or high grade car wheel metal. I can safely state that I concede it impossible to make such quantities of pig out of ores not adapted, for such is the fact. The cost at furnace would exceed 50 per cent. over the \$12.51 estimate, or at least \$21 per ton. This would be a mere practical illustration of the several furnaces on the Chesapeake and Ohio Railroad operated up to 1873, and some were of a first-class kind, using charcoal and coke fuel separate and mixed. Pig iron of standard quality for foundry uses sold at leading points of consumption during that period from \$40 to \$65, and demand exceeded supply. Now I question if a single furnace earned 6 per cent. on value of property and capital, and one-half of them resulted in loss or ruin to the owners, and none have averaged to this date a dividend equal to interest, as the books of said furnaces will prove, and the unfortunate owners attest. I will name two of said furnaces, and they are most favorably situated, and had experienced owners and ample capital. Buffalo Gap Furnace, owned by wealthy Baltimore capitalists, and built by approved builders, embracing best machinery, with ample capital and credit, and its directors old experienced iron manufacturers, broke down in 1872 and '73, and sold out for \$40,000 mortgage in 1874. Notwithstanding, Buffalo Gap is one locality designated as having the 24x40 feet deep hematite ore. There was such a scarcity of ore that nearly all used had to be obtained elsewhere and freighted there. The mountain limestone was there, but not of the approved quality. The Elizabeth Furnace was some ten miles west on C. & O. R. R., built during the war, but rebuilt after, and improved machinery introduced; its owners and managers were the most experienced ironmasters of Virginia, covering forty years, and had large cash capital. Here there was an immense deposit of hematite iron ore, some one-half mile back of the furnace, and would gravitate to furnace mouth; limestone also as near, with forest surrounding and water-power. The ore was such that the pig iron rated coil-short, and sold at low market rates; limestone too impure to flux the ore well. Here every means was adapted to improve the metal; charcoal alone was used, then mixed fuel of coke, and finally coke alone, but to no purpose, and in 1874 it came to grief. Incorporated, went on again until abandoned by the new organization after many months' trial. These are facts that theory will not disprove. These ores might from selected sample show 50 per cent. metallic iron, but run of mine required some three tons of ore for one of pig iron. The coke used here was mainly from Connellsville, Pa., costing double what charcoal would.

Two other furnaces are named by the letter of October 21st. I will only allude to Quinnesmont, located in Fayette county, W. Va., built in best manner at a large cost by an experienced party, 'with Eastern capitalists' money. Here coking coal abounded; stood aside a branch of C. & O. R. R.; no iron ore or limestone on said property. Clifton Forge, some 140 miles east, was source of ore supply (a fossil ore); had to go some 40 miles for limestone. Now the books of that company can show if they can make Bessemer or car wheel metal at \$21 a ton, or more than fifty per cent. over the theoretical estimate named in the letter of October 21st; and any practical founder can say if Quinnesmont Furnace is as well located as Elizabeth Furnace for cheap iron making or transportation to best markets. I state these facts not to show that Virginia cannot compete with any locality in quality and cost laid down at market, for the reverse is the fact. Virginia can, and is now making the best quality of car wheel pig and flange blooms, with charcoal fuel to meet the low market values, and with a net profit clear of interest on capital employed and property, laid down in any city from Boston to Chicago; but the locality named by letter of 21st October cannot do so in price or quality. For several years prior to 1873 I investigated and personally examined (backed by sixteen years' experience as an iron merchant) through several states for the purchase of an iron property commanding the advantages requisite to insure success in all conditions of the market, and compete with any quality or locality where nature placed every ingredient and power to produce iron in close proximity. I was acquainted with many works and quality and success of their business, and considered the Valley of Virginia and West Slope of Blue Ridge, and its unsurpassed climate as where nature had most blessed man for iron manufacturing. Here hematite and other iron ores abound almost unlimited. I have seen a 60 foot shaft not go through a deposit, and the average would make one ton pig metal from 2 to 2½ tons of ore. Limestone abounds, and forests prevail through this entire section, and many places water-power. I have seen many cases where all the ingredients and water-power were embraced within a radius of two and three miles, requiring no mixture to make the best metal—living cheap and labor abundant. The Valley Branch of B. & O. R. R. affords low freights to all markets.

Respectfully, yours,  
H. C. WYETH, OF WYETH & BRO.

## AMERICAN SCREW CO.,

Providence, R. I.

Manufacturers of

IMPROVED  
Gimlet Pointed Wood Screws,  
Patented

[May 30,

1876.]

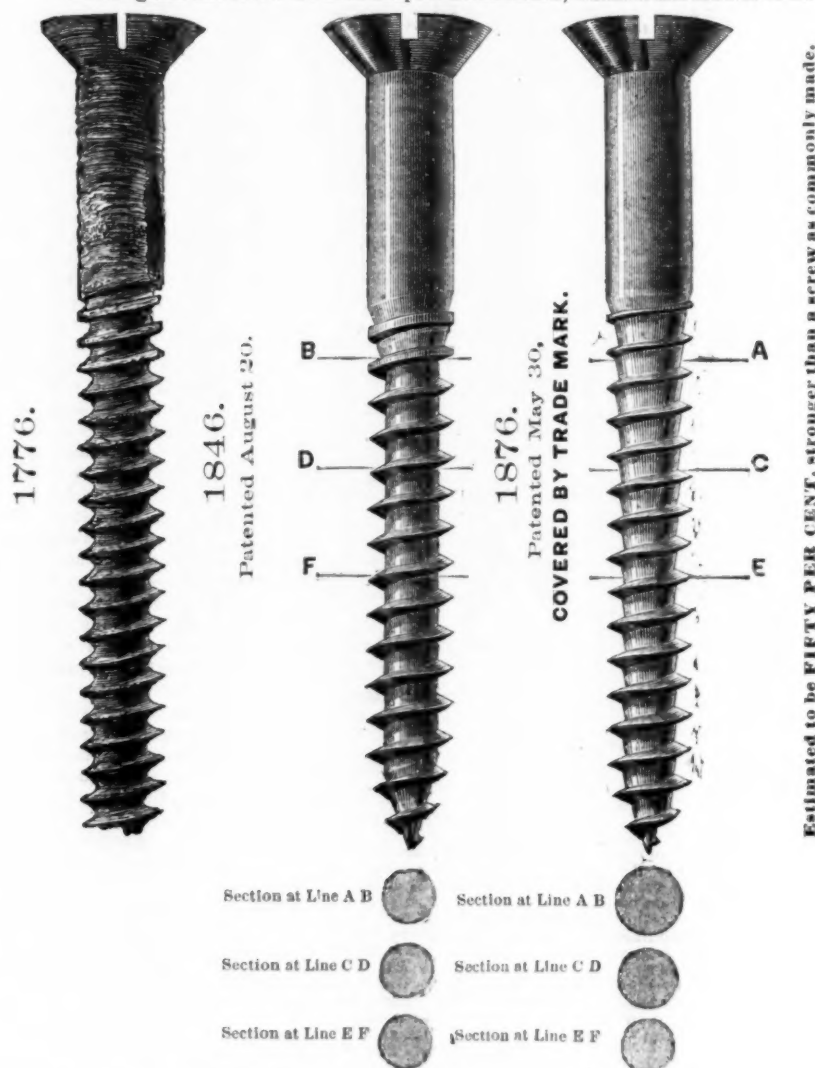


After forty years' experience we offer to the trade our Centennial Screw, patented May 30, 1876, as the best we have ever known.

The method of manufacturing is also patented, and we are changing our machinery as fast as possible, to manufacture the improved article only. To introduce them, they will be sold at same price as the old style screw.

The new screws will be packed in manila colored boxes with new label covering end of box, and enlarged figures showing plainly contents.

To distinguish this screw we have adopted a trade mark, which is also secured to us.



The above drawings show the progress of screw making from the old blunt point to style now adopted.

Experience has shown that the weak point of screws, as formerly made, is at the heel of the thread, where all the strains of forcing the screw into the wood naturally concentrate.

To avoid the sharp angle existing in the old style of screws has been the aim of all manufacturers, but every expedient hitherto adopted has proved as objectionable as the evil complained of.

It will be seen in our new screw that not only is the sharp angle avoided, but the strength very much increased, as illustrated above. See sections at lines.

## CLAIM.

"A Pointed Wood Screw having the outer periphery of the thread upon its body cylindrical, while a portion of the body below the thread and near the neck is conical, the remainder of the body to the point being cylindrical, and yet having all the thread brought to an edge of a constant angle, without jogs in the paths between the threads, substantially as described."

## Tall Chimneys and Electric Conductors.

There are few chimneys which have any peculiar historic interest, but an exception is presented in one built at Glasgow by Mr. Joseph Townsend, and attached to that gentleman's chemical works. This chimney is to its neighbors what Mont Blanc is to the rest of the Alps—a giant among pigmies. The foundation of this chimney was laid in March, 1857, and on the 6th of October, 1859, the coping was added at the top, at a height of 468 feet from the foundation and 454 feet from the level of the ground.

At the foundation the outside diameter is 50 feet, and at the surface it has diminished to 32 feet, while at the top of the coping the diameter is 12 feet 8 inches. On the 9th of September, 1859, and while the chimney was still unfinished, and therefore before the mortar was dry, a storm occurred and resulted in swinging the chimney out of the perpendicular to the extent of five feet at the top. This accident, though perhaps directly due to the storm, had its origin in a neglect in the building process. Proper allowance had not been made for the contraction of the mortar used in setting the bricks, and as a consequence a certain number of planks were under a great pressure, being arched in the center. Suddenly one of these at one side gave way in the oscillation caused by the storm, and with the unequal pressure the chimney was then forced from the perpendicular to the extent above stated. That the accident occurred in this way Mr. Joseph Townsend ascertained by personal observation. For a time some fear was entertained that the whole chimney would come down, but on the 21st of the same month measures were taken to prevent this, and by the 1st of October the whole was restored to the original upright form. This was effected by sawing the chimney on the side nearest to an imaginary straight line. The following figures give the intervals at which cuttings were made:

1. ....	124 feet from the top.
2. ....	49 feet below 1
3. ....	22 " 2
4. ....	15 " 3
5. ....	12 " 4
6. ....	19 " 5
7. ....	20 " 6
8. ....	13 " 7
9. ....	20 " 8
10. ....	20 " 9
11. ....	40 " 10
12. ....	40 " 11
13. ....	41 " 12
	449 feet

When the chimney was only two years old it was struck by lightning, and a fire ensued, the composition gas tubing being melted at a distance of 100 feet from the gas meter, though this latter was situated 20 feet from the chimney. To understand how this happened, it is necessary to state a few additional facts. The chimney was provided with an electric conductor on one side, and a coil, which united with the conductor near the ground, where together they were bound to an iron rod and passed through a well of water, situated near the side of the foundation, 7 feet square and 2 feet deep, and thence down about 8 feet into the earth. Now, into this well comes the drainage of the works, and, further, the discharge pipe from a water closet, and it was found, on investigation, that although the pipe actually discharging into the well was of stoneware, yet, further back, it was in connection with one of cast iron. This latter pipe being midway between the conductor and the gas composition tubing, must have served as a vehicle for the electricity, which must then have completed its circuit by the gas pipe, which was thereby melted, and the gas escaping, caused the fire.

To prevent the recurrence of such an accident the cast iron pipe was removed and one of stoneware substituted. All now went well till three years ago, when the chimney was again struck by lightning at 150 feet from the top, 30 bricks being then dashed out. Again an examination was instituted, and it was found that a separation had been effected between the conductor and the rod of iron with which it was bound where it passed through the well at the bottom. This separation had probably happened before the accident occurred, and so possibly caused it. A new rod 10 feet long and passing 8 feet into the earth was now substituted for binding the conductor and coil together, and the whole was well tallowed to prevent oxidation, and was finally inclosed in a wooden box, of which the side of the chimney made the fourth. But a year ago the chimney was once more struck by lightning on the opposite side to that which was last attacked, that is on the side along which descends the conducting rod. On this occasion a part of the coping stone was knocked off, and Mr. Joseph Townsend, impressed with the necessity of making some material change in the whole system of protection from lightning, is now providing the chimney with an apparatus which it is to be desired will fulfill its object.

This arrangement may be described in a few words. On the top of the coping stone are fixed four equidistant rods about three inches wide and one inch thick; these terminate in stars or arrow-heads, and above them in the center ascends a rod 20 feet long and higher than the rest, terminating in a double arrow-head. All these are properly connected with bands of iron and are placed in good communication with the electric conductor and coils.

As may be readily imagined, there is some difficulty and not a little danger in raising such masses of iron to the height of 470 feet, but still more difficult and dangerous is it to construct the apparatus at the top, and fix it and bolt it together as is required. For beside the exposure of the workman to the gases from the chimney, the atmosphere is often highly electric at that height, and freedom from sudden wind cannot be insured. The construction is nevertheless approaching completion, and the whole of it has been done by one man, Mr. R. Hall. He is, perhaps, the only man who would undertake such work, and yet he does it with scarcely a sense of danger and certainly with none of fear. It seems as easy to him to walk about and work on the coping stone as it is to many of us to walk about on the ground.

In concluding this sketch, which we hope may prove of some interest to manufacturers who have tall chimneys attached to their works, we would merely point out that not a little success of the working of an electric conductor depends upon the way in which it is sought to distribute the electric current over the earth. It is not sufficient simply to pass the rod down so many feet into the ground, but it should terminate preferably in a plate or sheet of iron so as to present a good surface for diffusion.—Iron.



## Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From our Regular Correspondent.)

SHEFFIELD, ENG., Oct. 31, 1876.

### THE CRISIS.

It is still upon us, but it now elicits mildly, and we patiently await the progress of events. The negotiations which have been in hand during the past week have been of a contradictory character, and, as usual, there has been an enormous amount of diplomatic lying to go through. This lying is doubtless well intended by somebody, but, as a rule, it falls in its main object, which is to induce the people to believe that their interests are being considered, in preference to those of the autocrats, the place hunters and the hangers on. Few people, however, are deceived by the voluminous telegrams daily published from nearly all the chief European centers, but are content to await whatever may turn up with a cynical indifference as to consequences. In the meantime the trading and mercantile communities are taking heart of grace, and are peddling away with as much vigor as ever, but with infinite caution and within a limited circle only.

### THE ARCTIC EXPEDITION.

has just returned, quite unexpectedly, and has by its appearance given an agreeable flip to the otherwise stale dullness of existence. The ships have only been absent from England one year and five months, and now return with the news that the polar circle is impenetrable, and that north of 83° 20' there is no land, but rugged masses of ice 200 feet in thickness, extending 400 miles up to the polar point. The sun was absent 142 days, and at one time the temperature descended to 104° below freezing point. They lost four men, but in the general results of the expedition are included the finding of excellent coal near a spot named Discovery; many fossils and corals—the last also doubtless fossils. President Land is declared to have no existence, and Greenland to end in 82° 54' latitude.

### THE AMERICAN MAILS.

At the end of this year, and thereafter, the Postmaster General of Great Britain has decided to discontinue the subsidies hitherto and now paid to the Cunard and Inman companies in respect of their conveyance of the mails from Liverpool to the States. They have been subsidized at the rate of £110,000 per annum, which will thus be saved. The system of open contracts will be adopted, the line making the three quickest previous voyages to be entrusted with the mail. I do not doubt that in these dull times there will be plenty of competition, but when the passenger traffic and freights are heavy, I fancy the mails will be very little sought after.

### THE LONGEST RAILWAY RUN.

Up to a short time ago the longest regular run on any English line of railway had been from London to Peterborough on the Great Northern, a distance of 77 miles, run by all the expresses in about 90 minutes. The Midland tried running from London to Leicester, 96 miles, for a time, but they soon discontinued the practice. The Great Northern (our pattern fast passenger line) now runs its 10 a. m. Scotch express from London to Grantham, 105½ miles, without stopping, every day, and keeps to time. This is, I suppose, the longest and fastest run in the world.

### ORDNANCE vs. ARMOR.

Another little duel between these old opponents took place on Friday at the Italian dockyard of La Spezia. The attack was conducted by the 100 ton gun recently made by Sir William Armstrong, and the following account is given of the results: "The targets in all cases had a strong backing and a skin about 30 inches thick, faced with different plates, two of Schneider's steel, one of Cammell's wrought iron and one of Marrell's wrought iron. All the plates were solid, and 22 inches thick. Each plate weighed about 22 tons. Not one of them could withstand the shot of the Armstrong gun fired with 341 lbs. of powder; but Schneider's steel plates, though they broke up, stopped the projectile from quite piercing the backing, whereas the targets covered with wrought iron plates were completely pierced, leaving large ragged holes. The shots had enough velocity remaining to have knocked out plates on the other side of the ship, and would have carried complete ruin into the interior. Those which failed to pierce the steel clad target would have shaken the whole structure and caused a leak. The highest velocity on Friday was 1500 feet, and the heaviest blow was equal to 31,250 foot tons. The Ministers of Marine and War were present, and also three English officers, several military attaches, and the officers from the Russian corvette Ascol, which arrived at Spezia on Thursday."

### RAILWAY TRAVELING.

In England is not in all cases the pleasant thing many people would suppose. On all our Northern and Southern lines it is agreeable enough, but in the West and East there are experiences to be obtained of a widely different nature. Captain Tyler's exhaustive report as to the Long Ashton accident on the Great Western (when a number of persons were killed) reveals some of the causes of this uncomfortable and unsafe traveling. From the Captain's report we gather that in a length of 77 miles of way he found no fewer than 6438 defective timbers, 8269 defective rails, 325 broken joint plates, 225 bad rail joints, and 533 rails with insufficient fastenings, and 3000 defective rails, and 1679 timbers not included in this enumeration had recently been replaced by new ones. The "miscellaneous defects" are thus enumerated: The gauge when tested at the quarter-mile posts was found to be tight in 122 places, of which 18 were on curves; sometimes both gauges of both lines were found tight to gauge, and the degree of tightness varied to as much as 1 in. in the narrow gauge on a curve. In 44 different quarter-mile sections it was especially remarked that the rails had a bad top as regards line or level, or both. The new narrow gauge rails had in many places sunk below the proper level. Want of sufficient ballast was frequently noted, and in other places the existing ballast required to be properly broken. Better drainage was necessary on many parts of the line. The arches of 17 bridges and eight culverts required more or less repair. Forty-two cracked steel rails were found, of which 38 were within six miles of Bristol, and eight broken crossing points were also found. In the iron road there were many short bolts, 13 iron sleepers broken at rail joints, and 13 broken joint clips. Had this been in the State I suppose we might have ventured

to be virtuously indignant about such a gross state of affairs—indeed I am glad to say that as it is, most of the newspapers are hitting out pretty straight at the Great Western Company.

### THE WEEK'S EXPLOSIONS.

have been quite numerous, and of a sulphurous nature which, of itself, betrays the near approach of the Fifth of November—that day of squibs and crackers, powder and brimstone, Gunpowder and Irish rows. Firstly, a plim named Pearson experimented with a quick match in a powder cabin at Binchester Colliery, Durham, and blew up the whole concern, himself included. Then, near Sheffield, two boys effectually blasted themselves in a scorching manner by means of a quantity of powder, which they found too much for them, and so retired in much confusion. At Sheffield, a gas filter caught a leak with a naked candle and stood off. He now lieth in the infirmary. At Stockport, a boiler on the premises of Messrs. Dick Brothers exploded so forcibly as to nearly kill three of the work people, and to quite ruin the factory. At Barnsley, another ingenious person actively sought after—and found—an escape of gas with a candle in hand. He also now repenteth. On board H. M. S. Adelaide two men were badly wounded by the blowing out of the breech piece of a cannon, owing to it not having been properly screwed up.

### FAILURES.

An order has been made for the winding up of the Palace Company, London, with liabilities amounting to about one million sterling, chiefly for building contracts. Messrs. Welch & Hanbury, commission merchants, London, have failed with £200,000 liabilities and £55,000 assets. The liabilities of Messrs. Keller & Hahn, London and Birmingham, jewelers, are £18,600.

### A FEW FIRES.

have taken place during the week, irrespective of the several scores which have happened in London in the period. At Renfrew, Scotland, an engineering factory has suffered to the extent of £20,000. At Eaglesham, near Glasgow, Webster's mill was burned down last Monday, the damage being £18,000. At Newbury, near Bradford, a flannel manufactory has been destroyed, the loss being £5000. At Bradford, on Saturday, the manufactory of Taylor & Parsons was burnt down with very heavy damage.

### SCOTCH PIG IRON.

has been weaker and rather quieter during the week, Thursday being a strict holiday, on account of the Fast. Messrs. Wm. Colvin & Co. report "very little animation, and makers' iron quiet with reductions in some instances." There are 95,174 tons in Connal's stores.

Freights are unaltered. James Watson & Co. report (Oct. 27): "The warrant market opened quietly on Monday at 56/6, cash, but has since advanced to 57/3, one month fixed, closing firm, buyers at 57/1½, cash, sellers, 57/3. Shipments last week were 10,278 tons, against 8108 tons in the corresponding week of 1875. We quote:

Deliverable alongside.	No. 1.	No. 2.
G. M. B. at Glasgow.....	56/6	56/6
Gartsherrie.....	56/6	56/6
Coltness.....	56/6	56/6
Summerlee.....	56/6	56/6
Langston.....	56/6	56/6
Carbarnock.....	56/6	56/6
Calder, at Port Dundas.....	56/6	56/6
Glenarnock, at Ardrossan.....	56/6	56/6
Eglington.....	56/6	56/6
Dalmellington.....	56/6	56/6
Shotts, at Leith.....	56/6	56/6
Kinnell, at Bo'ness.....	56/6	56/6

Messrs. John E. Swan & Bros. (Limited) quote No. 1 brands as under: Gartsherrie, 57/3; Coltness, 56/6; Glenarnock, 56/6; and Eglington, 57/3.

### TRADES OF SHEFFIELD.

The past week has been productive of very little change, almost every branch remaining in a quiet condition. The effect of the continued uncertainty of political affairs in the East is still highly prejudicial to the progress of the leading industries here as elsewhere, merchants and others being quite out of the field until something definite shall be determined upon. The European government buyers are also abstaining from making large purchases of any sort, it being considered likely that if war should become anything like a matter of certainty they would even abstain from ordering armor plates in order to await the results of the great duel between modern ordnance and modern armor. In the meantime the armor plate shops and mills are fairly busy in completing work for our own Admiralty, their productive powers being, if anything, in advance of the capabilities of the arsenals and dock yards to deal with. Considerable lots of six-inch plates and other sizes up to twelve-inch are being sent off just now, a fine plate of the latter thickness weighing thirty tons having been rolled at the Atlas Works last week. At this establishment a section of the 26 inch plate rolled some weeks back has been polished and placed in the entrance hall to the offices, in common with other model specimens of metal-lurgy.

The steel rail business here is very irregular. Some of the local mills are doing an apparently good business, but the profit secured is said to be rather problematical, it being considered somewhat difficult to "make much" out of steel rails at little, if anything, over 47 per ton. At one of the largest works all the rail orders have been worked off, and the men in the mill have received notices to leave on Saturday.

In pig iron and spiegeleisen there is no quotable change and no material alteration from the previous fairly steady demand. In the iron trade there is a moderate amount of work, some of which has been secured, I am informed, by a reduction in prices. This reduction has been made by some of the manufacturers owing to the cheaper rates at which they can now buy steel and fuel. The fall in steel has not been very marked, but on an average it is probably ½d. to 1d. per lb. cheaper than it was three years ago. File prices are, however, cut very fine, the discount is ranging up to as much as 55 per cent. from the list.

At one, at least, of the principal iron works of this town there is a very steady output of boiler plates for local and general use. Those plates are branded and have long enjoyed a high reputation among the boiler makers of the district and others who have been accustomed to make use of them. Prices are steady. A Leeds newspaper reports that for the year ending June 30, 1876, the Corporation Gas Works of that town made a net profit of about £22,000. In addition to that sum £5000 have been spent in renewals of works, £9000 have been added to the sinking fund, thus making the total profit of the year about £26,000. From July 1st the price of gas has been lowered from 3/9 to 3/3 per 1000 feet. In consequence of this prosperous state of things the town council have resolved to seek parliamentary powers for extending the gas works at a cost of £200,000, beside enlarging the Eecup reservoir, widening a large number of streets, and effecting a number of sanitary improvements at a great total cost.

The process of doubling the South Yorkshire line of the Manchester, Sheffield and Lincolnshire Railway having now been completed, the new rails will be used for traffic on and after Sunday next.

Several wages disputes exist in the district, although none are on a very important scale.

At Sheffield, the whole of the railway spring fitters still remain locked out, and no effort appears to have been made to effect a settlement. At Belper the large nail makers—Gunnsmore, etc.—are out on strike against a proposal to reduce their rate of payment, which is by weight, to the extent of 3 1/2 per ton. Three men earn 12/ to 18/ per week. There have been frequent disputes in the trade, which is in consequence gradually leaving the town. At the Kilburn Colliery, Derbyshire, the miners have sent in a demand for an increase of 3d. per ton, and certain alterations in the mode of weighing the coals; both of which requests the proprietors declined to accede to, in consequence of which a strike is imminent. At Thrybergh Hall Colliery a dispute has arisen as to wedding prices, but has been referred to arbitration. The men have, however, refused to abide the award of the three arbitrators, to whom the matter has been referred.

The annual general meeting of the shareholders of Sanderson Bros. & Co. (Limited), was held on Friday in the Cutler's Hall, Sheffield, the meeting having been postponed in order to allow of the completion of the American arrangements. Mr. Bernard Wake presided, and there were present Mr. E. Hall, director; Mr. Halcomb, managing director, and not more than half a score of the shareholders. I understand there are hardly fifty shareholders in the company. The proceedings were conducted in private, but I believe the ordinary dividend of 10 per cent. was declared, and the action of the directors on the American transfer endorsed by those present.

### BIRMINGHAM AND STAFFORDSHIRE.

The iron trade of these districts continues in the usually described, and the foreign trade being now more limited than ever, owing to the war rumors. There is a better home demand, however, especially for common and medium iron, but at such exceedingly bare prices that makers say they prefer to remain idle than run machinery and incur all sorts of expenses all to no purpose. Common bars are 26/ 10/ to 26/ 15/; singles, sheets, 29/ to 31/; hoops, 28/ to 29/; boiler plates, 41/ to 43/ according to quality. The hardware manufacturers are still doing a steady business, mostly for the home and Colonial markets.

### SOUTH WALES.

Last week the iron exports reached a total of 258,000 tons, chiefly in cargo for Oporto, Rotterdam, Port Natal and Königsberg. Of coal over 110,000 tons were despatched. Few rail orders are in hand, but at Tregedre, Duwals and Ebbw Vale there is a little work of the kind in course of execution. Iron rails are quoted 25/ to 25/ 5/; and steel rails 26/ 10/ to 27/ 10/; f. o. b., Cardiff or Newport (Monmouthshire). In tin plates a little more is doing.

### GERMAN IRON PRODUCTION.

From interesting statistics just issued by the German government for the year 1874, it appears that during that year there were 324 blast furnaces, which worked for a total of 2801 months, or, upon an average, for about eight months and ten days each out of a possible total of twelve months. The quantity of iron ore used amounted to 4,342,184 tons, of which 4,130,090 tons were produced in Germany itself. The total quantity of pig iron and cast iron of the first quality produced was 1,660,308 tons. The mean working population employed in the trade was 22,765, of which number 883 were women. The positions held by the respective States of the Empire were as follows: Prussia stood first, with 244 blast furnaces and a total production of 1,330,268 tons, valued at £5,750,268. Next come the Rhine Provinces, with a total production of 541,483 tons, and a value of £2,392,465; Westphalia, with 311,559 tons, and £1,451,599; Silesia, with 276,258 tons and £1,221,655; Hanover, with 100,152 tons and £444,308; Hesse Nassau, with 37,029 tons and £248,301; and Hohenzollern, with 438 tons and £3976. None of the other States produced as much as the three provinces of Prussia first mentioned; but Alsace-Lorraine follows close in the wake of Silesia with 251,419 tons and a value of £774,158; and then come Bavaria, with 49,273 tons and £227,302; Saxony, with 22,050 tons and £130,182; Hesse, with 16,753 tons and £78,175; Brunswick, with 15,730 tons and £87,113; Württemberg, with 10,536 tons and £58,116; Saxony-Meiningen, with 12,913 tons and £42,680. Altogether, with 624 tons and £3550; Reuss, with 493 tons and £2492; and Waldeck, with 124 tons and £1108. A table is appended to these returns giving the quantities and value of the pig and cast iron produced during the last ten years. From 1865 to 1874 the value of the pig and cast iron produced increased without intermission until 1871, in which year they were 1,430,830 tons and £5,946,589. In the following year, when the production of Alsace-Lorraine was included for the first time, there was a further increase to 1,807,345 tons and a value of £10,585,049, the rise in value, as will be seen, being considerably greater than the rise in quantity. There was an increase again in 1873 to 1,983,163 tons and £11,283,938, but a fall in 1874 to 1,660,308 tons, as stated above. The reaction of prices was also very considerable, as the 1,660,308 tons realized but £7,439,589, or about 45/ per ton, as compared to nearly 46/ per ton in 1873.

### THE METAL MARKETS.

closed steadily on Friday evening at about the following rates: G. o. b. Chili bars, 27/ to 27/ 10/; Wallaroo, 28/ 10/; Burra, 28/ 10/; and tough English, 28/ to 28/ 10/ Indian sheets, 28/ 10/; Tin was steady at 27/ for Straits, spot, and Australian, 27/ to 27/ 10/; English ingots ruled 27/ to 27/ 10/; Lead is unchanged. Spelter, 22/ 15/ to 23/.

Messrs. Von Dadelzen & North say: "Copper.—A considerable business has been done in copper, gradually advancing prices, from 27/ 10/ to 27/ 10/; cash, for g. o. b., and 27/ 10/ for named brands and forward delivery. Wallaroo, which remains very scarce, has advanced to 28/ 10/ to 28/ 10/; Burra is also better, but in the same proportion, 28/ 10/ being the nearest price. English firm. Best select, 28/ to 28/ 10/; tough, 28/ 10/ to 28/ 10/; sheets, 28/ to 28/ 10/; Tin has fully recovered last week's decline. Straits is held from the market, and only a small business could be done from 27/ 10/ to 27/ 10/; at which there remain sellers. Australian, a large business reported from 27/ 10/ to 27/ 10/; cash. Banca, here, 27/ 10/; in Holland, 43/ 10/; and Biliton, 43/ 10/; English tin, 27/ to 27/ 10/; Tin plates remain in moderate demand, but prices are unchanged. Lead is firmer and scarce for immediate delivery. Good soft English pig, 21/ 12/ to 21/ 15/; Spelter remains steady. Silesian, 22/ 15/ to 22/ 15/; special brands in outputs of 10 to 15 tons. Quicksilver.—A fair business doing at 48/.

The Mining Journal remarks: "Copper.—On Monday 27/ was realized for Chili bars, but the buying was limited to only one or two quarters, and was not in any way general; indeed, on early 'Change not over 27/ 10/ could be obtained either for cash or forward, but it transpired later in the day that 27/ had been given, and 27/ 10/ for Wallaroo ingots. On this announcement buyers more readily offered 27/ 10/ for g. o. b. The market on Tuesday opened with sellers at 27/ for Chili bars for prompt and forward, and during early 'Change it was said that 27/ 10/ was paid for g. o. b. forward, and upon this buyers gave 27/ for cash parcels, but they were soon satisfied, and sellers continued to offer bars the remainder of the day at 27/ 10/ On Wednesday the price advanced 27/ for cash parcels, although at one time there was a little easiness, and price

seemed to be giving way, but it was received, and 27/ 10/ six weeks, was announced. Thursday's business was limited, and previous operators did not seem disposed to go on increasing their purchases any longer; nevertheless, it was reported that 27/ 5/ cash, had been obtained. But the final summary of the day still showed bars to be procurable at 27/ 5/ cash, and 10/ higher for forward delivery. Lead.—During the past week our market has undergone scarcely any change. Sellers have held firmly to their prices, and are not likely to lower them while supplies keep moderate and the prospects of war continue. Spelter.—In moderate request; sellers maintain previous quotations. Zinc at public auction has been sold down to 26/ 5/; being a reduction of 5/ per ton upon last sale. The importations of foreign zinc are so large that they greatly interfere with the sale of English, and render the manufacture of it a very bare business. Quicksilver.—Sales in small quantities only continue to be effected at 28/ per bottle for Spanish, but below this figure sellers decline to make sales.

Liverpool quotations are unaltered.

Iron: f. o. b. in Liverpool, per ton.	£	s.	d.	£	s.	d.
Merchant bar.....	6	15	0	6	17	6
Merchant bar, in Wales.....	6	5	0	6	7	6
Staffordshire.....	7	5	0	9	15	0
Hoop.....	8	0	0	9	0	0
Sheet.....	9	10	0	10	10	0
Nail rod.....	7	10	0	9	0	0
Bar, best crown.....	7	5	0	8	0	0
Boiler plates.....	9	5	0	10	10	0

Tin Plates: f. o. b. in Liverpool, per box.

£	s.	d.	£	s.	d.
Charcoal, I. C.....	0	19	0	1	6
Coke, I. C.....	0	19	0	1	10

Copper: Delivered in Liverpool, per ton.

£	s.	d.	£	s.	d.
Bolt and Sheathing.....	82	0	83	0	0
Tin.....	82	0	83	0	0
Tough cake.....	82	0	83	0	0
Best selected.....	82	0	83	0	0

### The Kroehnke Amalgamation Process at the Centennial Exhibition.

Among the numerous special buildings situated west of Machinery Hall is the one erected by the Republic of Chili, to accommodate a large and elaborate working model, serving to illustrate the Kroehnke amalgamation process. The model is very well executed, and is a copy in all its details of works at Antofagasta, Copapo, province of Atacama. It is on the scale of one-sixth. The miniature engines which put it in motion are supplied with steam from an adjacent boiler.

The ore, which is, as we understand, both custom and purchased, is when delivered sampled. The sample is crushed in two pairs of rolls, and subsequently reduced to a fine powder, from which the material for the assay is taken. After sampling the ore is conveyed by means of a tramway to large cones lying in the rear above the crushing apparatus, into which its discharge is regulated by an automatic feeder, which, though its merits are not striking, possesses at least the advantage of being simple.

The crushing is effected by a pair of wheels of 5000 to 6000 pounds each, rotating around a vertical axis in a trough. In the model there are six of these "trapiche," the capacity of which amounts to about 6½ to 7 tons per day, so that 12 are necessary for a mill working 75 tons. The power for such an output would foot up to about 70 horse-power. The crushed ore is carried off from the trough by a constant stream of running water in the shape of slime, as it is considered imperative for the subsequent amalgamation that the ore should be in a fine state of division. The slime is allowed to settle in tanks, from which, after settling, the supernatant clear water is gradually drawn off as much as practicable. It is then dried, which in a climate like that of Chili is done by spreading it in the sun. The dry ore is carried to the amalgamating mill proper, and is charged into horizontal barrels of 7½ feet diameter and 8½ feet length, making from 3 to 5 rotations per minute. They are arranged in pairs, one on each side of the main line of shafting, to which they are directly geared. This arrangement does not permit the isolating of any one pair for the purpose of either changing its speed independently of the others, or of stopping it altogether. Therefore half the barrels at least must be charged and emptied at the same time, as the 24 barrels used are arranged in two sets of twelve. They require 80 to 90 horse-power, the same engine, however, sufficing to move other appliances to be mentioned hereafter. The capacity of the barrels varies, of course, according to the nature of the ore treated, but it may for ordinary rebellious material be placed at about 75 tons per day. The charge, varying from 2½ to 4 tons, is mixed with a hot saturated solution of salt, until it has assumed the consistency of a thick paste, and then a saturated solution of subchloride of copper is added, this being the chief feature of Mr. Kroehnke's process, as it is destined to perform the chlorination of the silver, thus doing away with any previous delicate chlorination roasting process, which the European method of barrel amalgamation requires. Mr. Kroehnke prepares his solution of subchloride of copper by dissolving five per cent. of the weight of the ore in salt water, and by adding to it a solution of sulphate of copper of 20° Beaume until saturation, and then heating the mixture by steam of three atmospheres. In order to prevent chemical changes he acidifies with sulphuric acid. The solution is considered fit for use when 50 c. c. poured into a liter of water becomes turbid from subchloride of copper.

The amount of solution used necessarily varies according to the amount of silver in the ore, and the nature of the gangue. Clay and oxide of iron, which are indifferent, require less than, for instance, lime, which decomposes the subchloride. If there be more than one per cent. of antimony or arsenic in the ore a preliminary roasting is required; small amounts of blende, copper pyrites or galena do not affect the results materially.

After having added the solution, the barrels are rotated for 10 to 12 hours, making about four revolutions per minute, at the end of

which time the chlorination has been effected. In order to prevent a loss of quicksilver in the subsequent amalgamation by the formation of chloride of copper resulting from some of the chemical reactions during the period, metallic zinc or lead is added, which decomposes the chloride of copper. The same is done when double silver ore containing horn silver are under treatment. An addition of 25 per cent. of lead silver in the ore has been known to have reduced the loss of quicksilver from 150 per cent. to 25 per cent.

After the chlorination is complete, quicksilver in amounts varying from 20 to 25 times as much as there is silver in the ore is added. It is important that the mass should have the proper degree of consistency, so as to render a fine division of quicksilver throughout the whole possible. The barrels are again revolved for 6 to 8 hours at the rate of 3 to 5 revolutions per minute, according to the nature of the material and its richness.

When the amalgamation is considered complete the whole is washed from the barrels and led through gutters into the settling apparatus, where the amalgam is separated from the slime by water kept in constant motion by revolving arms. The slimes pass off with the current of water, and the amalgam gathers in the bottom of the vessel, from which it is drawn. The liquid amalgam contains a large surplus of quicksilver, which Mr. Kroehnke removes by a centrifugal machine making 2500 revolutions per minute, instead of filtering it through canvas, as is done in most mills. If the amalgam be white it is considered clean enough to proceed directly to distilling; if, however, it shows black streaks, indicating the presence of oxide and sulphide of copper, it is brought into two small barrels similar to the large ones, two of which are attached to every set of twelve. In these barrels it is carefully cleaned by washing with hot salt water.

The pure dry amalgam is stamped into sheet iron cylinders composed of two parts, so that by drawing a bolt they may be easily removed, leaving a column of amalgam weighing from 1200 to 1500 lbs. It is conveyed to the distilling room lifted by a crane upon a small car, on which stands a cast iron vat filled with water. The amalgam is placed upon a tripod standing in this vat. The sheet iron shell is now removed, and the car run under a vertical wrought iron cylinder closed on the top. Its inside diameter is but little larger than that of the amalgam column, about 16 inches. The vat, tripod and amalgam are now raised by a simple contrivance, so that the two latter enter the cylinder, the lower end of which dips into the water for about 6 inches. We thus have a vertical retort, closed at the bottom by water, and within its upper end the amalgam. The upper two-thirds of the retort is surrounded by a fire of charcoal or coke, inclosed within a cylindrical fire-brick furnace. The fire being started, the quicksilver of the amalgam distills, and its heavy vapors are condensed in the water closing the retort until after 14 to 16 hours the operation is finished. The silver is then lowered from the retort, the water poured off, and the quicksilver returned to the main mill, where, after having been used some five or six times in succession, it is found necessary to purify it by the addition of 20 grammes of Crooke's sodium amalgam to every 100 kgr. of quicksilver. Four retorts are deemed amply sufficient for the output of 24 barrels.

The metallic silver is remelted in a reverberating furnace and freed from arsenic, if present, by stirring with an iron rod. The silver is cast into molds holding from 70 to 90 kgr. placed on a car. The whole distilling apparatus is so contrived as to be easily manipulated by one man, who may easily be controlled, thus avoiding the danger of loss by the pilfering propensities of the workmen, who are tolerably well aware of the value of the material which is being dealt with.

The chief feature of this process is the chlorination by means of the subchloride of copper solution, which in most cases, when there is not too much antimony and arsenic, avoids any roasting whatever, and always evades a chlorination roasting, a difficult, costly and comparatively wasteful process, which, though very much improved by the introduction of several furnaces of recent date, has not yielded more than 95 per cent. of the entire amount of silver in the ore in the shape of chloride of silver. The process is said to be peculiarly adapted to the treatment of ores, the chief gangue of which is calcespar, which in chlorination roasting would, if present in large quantities, require so large an addition of pyrites or sulphur for the decomposition of the salt as to make it practically impossible. Compared with the direct use of chloride of copper, the substitution of subchloride effects a very considerable saving of quicksilver, as has been proved by experience in Chili.

Mr. Kroehnke claims the process to be efficient also for the extraction of gold, but no data have come within our notice to warrant an opinion. It would be manifestly unfair to argue from the fact that in the European barrel amalgamation the extraction of gold is not so complete as in the Washoe process, that the same must apply to this process also. The losses of silver are asserted to amount to 1½ per cent.

Mr. Kroehnke has received an award both at the Chili Exhibition, at Santiago, in 1875 and at Philadelphia in 1876.

A new alloy for bell metal is proposed, which, it is said, does not tarnish, is less liable to crack, gives a better sound, and is much lighter in weight than the alloy usually employed for the purpose. It is prepared as follows: Nickel, 1 lb., and copper, 6 lbs., are melted and cooled. Add zinc, 1 lb., aluminum, ¼ oz. Melt and cool; melt again, and finally add ¼ oz. quicksilver, and 6 lbs. melted copper.



**HOLSKE MACHINE CO.**  
279 Cherry St., near Jefferson St.  
**ELEVATORS**  
For Hotels & Stores a specialty.  
Machinery in General made to order.



## BUSINESS ITEMS.

## MASSACHUSETTS.

The Putnam Machine Company have recently received an order from the Central Pacific Railroad for six lathes, two slotting machines and two iron planers, together with working tools and fixtures for the same. The same company sent a boiler plate clipping machine to Philadelphia recently.

The Springfield Armory is turning out forty guns per day, and about one hundred scabbards are cleaned daily. The latter work has caused a slight increase in the number of employees.

M. Gorman, Boston, for thirty years has been manufacturing files, principally of the finer kind, for watch makers, jewelers, piano and organ builders.

At Shelburne Falls the Lamson & Goodnow Cutlery Co. are running overtime. The small cutlery works owned by J. W. Gardner, and employing 25 men, are six months behind their orders. The old H. S. Shephardson bit and bit-brace factory, now owned by H. H. Mayhew & Co., employ a score of hands on full time.

The Warner File Works, Holyoke, are now turning out about 30 dozen file a day, which they consider a good showing for a new company, although their capacity is somewhat larger.

The wire mill at Charlton, of the heirs of Ira Berry, has been burned; insurance, \$3000.

## MAINE.

A corporation has been recently organized under a charter obtained last winter and the last special charter granted by the Legislature previous to the passage of the general statute regarding corporations, to be known as "The Katahdin Iron Company," with A. P. Gould as president, and O. W. Davis, Jr., as treasurer and manager, with its place of business in Bangor. The capital stock of the company has been fixed at \$100,000, which has already been taken, and operations at the Katahdin Iron Works will be hereafter carried on by it as successors to Mr. Davis. The works are still in operation, employing a large number of men, and under the new arrangement will undoubtedly continue to run during the winter.

The Pembroke Iron Company have of late been repairing and improving their mill, and it is hoped that they will start up in the spring with steady employment for all during the summer.

## VERMONT.

A. F. Hubbard, of Tyson Furnace, has purchased the property of the Spathie Iron Co., situated in and about Tyson Furnace, which includes farms, ore beds, hotel, store, furnace, woodland, &c. He intends at once to pull down the buildings and put in a saw and wood-working mill.

## PENNSYLVANIA.

The mill factory of the Pittstown Iron Co. was idle last week.

The Maiden Creek Iron Works were bought by Hunzinger, Erb & Spang. They resolved to put the furnace in operation next spring.

The McHose Fire-brick Works, of Reading, will resume operations next Monday. Four car loads of clay have been received and two more car loads are on the way.

The Bird Coleman Furnace produced 181 tons of No. 1 and 2 iron week before last.

It is stated that a firm from Zanesville, Ohio, are about to start a plow and wagon works at Beaver Falls.

A portion of the works of the Phoenix Iron Company, at Phoenixville, after a temporary suspension, resumed operations on Wednesday, Nov. 8.

Forty-two thousand tons of rails were sold last year by the Pennsylvania Steel Company.

Messrs. Emerson & Ford, of the saw works, Beaver Falls, have presented a petition in the U. S. Court, praying to have themselves adjudged bankrupts.

J. J. Fisher & Co., of Kincardine, Canada, are erecting one of their best edge boiler plate clippers, described in *The Iron Age* of August 10th, 1876, at the Baldwin Locomotive Works.

Messrs. I. P. Morris & Co., of Philadelphia, have just closed a contract with the Brazilian government for the erection of two large iron lighthouses for the coast of Brazil.

Corydon Winch has recently closed a contract with an Eastern firm for a cargo of merchant bar iron and spikes for shipbuilding purposes.

## PITTSBURGH AND VICINITY.

Zug & Co.'s new mill will be completed about the first of next week. The workmen are now engaged in putting on the roof. The new engine and the battery of boilers, however, will not be in working order for two weeks.

The Edgar Thomson Steel Works, at Braddock's Field, have shut down for repairs.

## OHIO.

The Cleveland Iron Works are running full time on rails and bar iron. In the furnace they are making from fifty to sixty tons of pig iron daily. They employ nearly five hundred men.

The Standard Iron Co., Cleveland, employ 85 men, and are running double turn, making 6 tons of galvanized sheet iron per day. They occupy 1 1/2 mill and galvanizing shop.

The Powell Tool Co., Cleveland, are working about 60 men, turning out one hundred dozen edge tools per day; pay roll \$4000 per month.

The Cleveland Wire Works now have in their employ 65 men and boys, and furnish every description of wire cloth and ornamental goods. Their trade extends all over the country. They have lately erected two new buildings, 25 by 40 feet in size, with fine machinery, and are enjoying a good trade, which is steadily on the increase.

The glass factory in Kent is in full operation, and exhibits a steady improvement in business. The Lake Shore Rail Mill, branch of Cleveland Rolling Mill Co., is running double turn, employing 250 men, and making 85 tons a day finished iron rails. It is doing well, and has been running night turn since January 1.

All the Zanesville glass manufactories are in full blast with big orders.

The Ironton Furnace will start as soon as the company are in receipt of the necessary coke, 200,000 bushels of which have been ordered from Conneleville and will be here on the first suitable water.

The Gaylord Rolling Mill Company, Cincinnati, recently received a splendid endorsement of their boiler plate in the report of a recent test of the tensile strength of their material. Ten samples, each 25-100 of an inch in thickness, and from 98 to 101 inches in width, and each stamped 60,000 pounds tensile strength per square inch, were tested by Capt. Fisher, Government Inspector of Steamboat Boilers in the Cincinnati District, and his report gives the test of tensile of the weakest as 66,066 pounds, and the strongest as 80,000 pounds per square inch, the average being 74,432 pounds. This shows conclusively that the iron is at least 10 per cent. more strain than it is intended to.

The Falls River Co., of Cuyahoga Falls, are making about a ton and a half of rivets per day of all sizes, from eight ounce tinners to largest size boiler and bridge rivets.

## MISSOURI.

For the first time since the panic of 1873 the St. Louis Bolt and Iron Company recently received a proposition of 5 per cent. extra for the immediate filling of an order, so briskly has the iron trade increased. Worst of all, the order came from Chicago, and was for a car-load of fish bars. The order was received at 10 o'clock in the morning, and by 4 that afternoon the bars were in the car.—*Commercial Gazette*.

The works, grounds, machinery, etc., of the American Plate Glass Company, located at Crystal City, Mo., were sold the other day for \$25,000. The cost of the grounds and construction of the works, a few years since, was nearly a quarter of a million dollars. A new company will be formed for the manufacture of plate glass on a more solid and substantial footing than the old corporation enjoyed.

## IOWA.

The Clinton Bridge Company were organized and commenced business but little over one year ago, during which time they have done an immense business. The company have a capital of \$25,000, which will be doubled probably at an early day. They have very complete works, comprising main building 40x30 feet, with additions 250 feet in length, an 80 horse-power engine, and machine that dresses the four sides of timber 16 1/2 x 12 inches at the same time, or three sides of timber 20x12 inches. During the coming winter shops will be added for doing all the iron work in connection with the building of iron bridges. The company have already put up or have under contract 8000 feet of iron and combination truss bridge. Some of the more important of their structures are: An iron bridge of 4 spans, 600 feet in length, over the Cedar river, at Vinton; 750 feet, Howe truss combination bridge, over Rock River, at Moline, Ill.; 400 feet 3-span combination bridge for the St. Louis, Bloomfield and Louisville Narrow-gauge Railway in Indiana. They have put up bridges in ten different states.

The Union Iron Works, Clinton, of A. P. Hosford, manufacture gang and circular saw-mills, gang edgers and lumber trimmers, engines, boilers, etc. They employ 40 hands. Clinton Iron Works, of F. G. Noyes, employ 25 to 30 hands. The Eagle Boiler Works, of E. Owens & Co., make a specialty of boilers, tanks, etc.

## ILLINOIS.

The United States Rolling Stock Co., of New York, have purchased the grounds, buildings and machinery of the late F. E. Canda Bridge and Car Works, at the corner of Blue Island avenue and Hoyne street, Chicago, for \$107,500. The company will take immediate possession, and commence operations at once, employing at the works 500 men. This company controls a capital of \$5,000,000, and the addition of its extensive works to the industries of Chicago will be an event of no small moment.

## KENTUCKY.

Messrs. Meikle & Co., of Louisville, have added to their plow and elevator works a large foundry, beside other auxiliary advantages. The new foundry was heated up, for the first time, Wednesday, the 8th inst.

## SPECIAL NOTICES.

Situation desired by a civil engineer of experience in computing strains in iron structures, and designing bridges, roofs and special machinery. C. SEYMOUR DUTTON, Keystone Bridge Works, Pittsburgh, Pa.

**TACKLE BLOCKS**  
BURR & CO.,  
Manufacturers of Waterman and Russell's  
Patent Iron Strapped Blocks,  
ALSO, MANUFACTURERS OF  
ROPE STRAPPED BLOCKS.  
31 PECK SLIP, NEW YORK.

**TO FIRE BRICK MANUFACTURERS.**  
Wanted a second-hand Furnace Brick Press, with or without the extra sized molds, to press from 12 to 20 inches in size. Address, with particulars, number of molds, sizes, price, &c.  
F. B. P.,  
Office of *The Iron Age*, 220 S. 4th St., Philadelphia.

**TO MANUFACTURERS.**—A young man for eight years in the Iron and Steel business desires a position in some manufacturing concern. Is a good salesman, and has been four years on the road; also good book-keeper and accountant, and thoroughly conversant with all details of office work. Can give best references.  
Address, F. W. C.,  
Office of *The Iron Age*, No. 10 Warren St., N. Y.

**Wanted,**  
An experienced man as traveler for an old established manufacturing company.  
Address, stating past employment, with references and salary expected.  
B. M. & Co.,  
Office of *The Iron Age*, 10 Warren St., N. Y.

## Special Notices.

## Agricultural Implements

for export and the trade; largest stock always on hand ready to ship at notice. Manufacturer of **COMMON SENSE STALK CUTTER, VICTOR CORN SHELLER, etc., etc.**  
A. B. COHU, 197 Water Street,  
"Everything for the Farm," containing illustrations of 200 of most improved implements of Farm, sent on receipt of 10c.

**The Champion Corrugated Ash Can.**  
The best in the market for **ASHES, WASTE, OR GARBAGE.**  
Prices reduced. Large discount to dealers. Address, **THE CORRUGATED METAL CO.,** East Berlin, Conn.

**A. PURVES & SON,**  
Corner South & Penn Streets, Phila.,  
Dealers in  
**Scrap Iron & Metals, Machinery, Tools, Shafting & Pulleys, Steam Engines, Pumps & Rollers, Copper, Brass, Tin, Habbit Metals, Foundry Facings. Best Quality Ingot Brass.**  
Cash paid for all kinds of Metals and Tools.

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FOR SECURING INVENTIONS, TRADE MARKS, &c., IN AMERICA AND EUROPE.  
No. 258 Broadway, New York.  
A. V. BRIESEN.

## DROP FORGINGS.

The TRENTON VISE & TOOL WORKS, Trenton, N. J., having increased their facilities, are now able to do all kinds of  
**Iron and Steel Drop Forgings**  
in quantities to order at reasonable rates.  
**HERMANN BOKER & CO., Proprietors,**  
101 & 103 Duane St., N. Y.

**FIRST-CLASS DRAUGHTSMAN AND MECHANIC** is open for engagement; will work either in shop or office, or fill up time in both if desired. Best references given. Terms moderate.  
Address, *Draughtsman*,  
Office of *The Iron Age*, 14 Fifth Ave., Pittsburgh.

A traveler of ten years' experience, well acquainted with the Eastern and Western Hardware and Saddlery Hardware Jobbers, wishes to make arrangements in the Eastern, Middle and Western States, commission, or both. Satisfaction reference given. Address, **"TRAVELER,"** Box 24,  
Office of *The Iron Age*, 10 Warren St., N. Y.

## TO MANUFACTURERS.

I wish to handle and introduce to the trade in New York and vicinity on commission, some good specialty, or special line of manufacture. Address, for information, references, etc.,  
**JOHN L. DIBBLE,**  
59 Marion St., N. Y.

## TO CAPITALISTS.

Wanted by a manufacturer of a leading line of Mechanical Tools, an active partner with \$25,000 to take the place of retiring partner. The business is long and successfully established, with a good connection in the Eastern, Middle and Western States, and is capable of being largely extended. For particulars, address, **Hardware Manufacturer,** Box 20, Office of *The Iron Age*, 10 Warren St., N. Y.

**W. & A. C. SEMPLE,**  
(Manufacturers' Agents.)  
**RAILWAY SUPPLIES, METALS, &c.**  
44 Third St., LOUISVILLE, KY.

We solicit the business of manufacturers who are desirous of being represented in this market.  
**Edson's Steam and Pressure Recording Gauge for Steam or Water.**

The inventors of this combined "Pressure Recording Gauge" and "High Pressure Alarm" have, after many years of persistent effort and at great expense, succeeded in perfecting a reliable and accurate instrument for measuring either air, steam or water, when subjected to pressure, and for denoting the same by a tracing upon Edison's Patent Log or "Chart." No manufacturer or steam user can afford to be without them. Adopted by the United States Centennial Commission for competitive test at the present Exposition, and has also been used by the American Institute for several years past as a standard gauge. To be found at the Centennial Exhibition under D 9, column 67, Machinery Hall. Circulars sent on application to  
**M. B. EDSON, 91 Liberty Street, N. Y.**

## TO RAILWAY MEN.

The advantages gained by using Ramsey's Car Truck Shifting Apparatus, are as follows:  
1st.—The power required to run a car on the level track is sufficient to separate the trucks from a car body.  
2d.—It avoids twisting or straining the car frames.  
3d.—The manufacturing cost of this Shifting Apparatus will not exceed one hundred dollars. And each one is capable of doing more work with less strain to the car, and without the assistance of an extra Steam Engine, than a Steam Hoist, costing twelve thousand dollars.  
At each one of the principal stations where car wheels are regularly tested to see how they stand the journey, a switch is placed, having a depression or pit about eighteen inches deep, with gentle inclines at each end, and on each side a narrow track, remaining on the level, upon which is small but strong trucks, designed to carry supporting beams or cross-bars extending from one to the other across the pit, for the purpose of bearing the car body, while the trucks run down the incline rails to the pit.  
A Working Model of this Apparatus is on exhibition in  
**Machinery Hall, Section C 4,**  
Canadian Department, International  
Exhibition, Philadelphia, Pa.

Communications may be addressed to  
**RAMSEY & SCARLETT,** as above, or to  
Box 162, Cobourg, Ontario, Canada.  
See *The Iron Age* of Sept. 7, 1876.

## DISCOUNT LISTS.

Hinges (Stanley Works) list.....10¢ to 50¢ each, 15¢ and many varieties of 25¢ to 60¢.  
Screws, Bolt, Flat, Hex and Butt List.—Contains all the lists and discounts that are used.....Price, \$1.00  
**Dayton & Lamberson, 97 Chambers St., N. Y.**

## VENTILATING &amp; STEAM HEATING.

A thoroughly competent engineer, with extensive experience in the above line, desires employment.  
Address  
**M.,**  
Office of *The Iron Age*, 10 Warren St., N. Y.

## Special Notices.

## Wanted,

A party with about three thousand dollars to develop the "Sunbeam" Illuminating Gas Stove now advertised in *The Iron Age*, fully covered by patent. To the proper person, a liberal arrangement will be offered.

**A. W. MORTON, Patentee,**  
22 Platt St., N. Y.

## TO LET,

**A Light, Handsome Office.**  
Possession Immediately.  
**HERMANN BOKER & CO.,**  
101 Duane Street, N. Y.

## NOTICE! POND'S TOOLS.

The undersigned has assumed the Personal Property, including accounts, finished and unfinished Machinery, good will &c., connected with the manufacture of **MACHINIST'S TOOLS** as conducted by Mr. Lucius W. Pond since 1847, and will continue the said business at the old stand, corner Union and Exchange Sts., Worcester, Mass., under the name of **DAVID W. POND, Successor to Lucius W. Pond.**  
**CARD.**—Having assumed the business mentioned above, I solicit Inquiry and Patronage, with guarantee that present standard of Workmanship, and quality of Machinery shall be maintained. A large quantity of New and Second-Hand TOOLS, ALL STYLES AND SIZES, For Sale at Low Prices. Send for list of second-hand tools. Store at 98 Liberty St., New York, will be discontinued from Feb. 1, 1876, and all sales made from manufactory.  
Respectfully,  
**DAVID W. POND,**  
Successor to LUCIUS W. POND.

## MACHINERY,

**New and Second-Hand.**  
One 12x36 in. Greene Cut-off Engine; one 10 H. P. Baxter; one Planer 60 in. by 12 ft.; one 42 in. by 12 ft.; one 30 in. by 8 ft.; one 22 in. by 5 ft.; one Lathe 36 in. by 15 ft.; one 24 in. by 12 ft.; twelve 15 in. by 6 and 8 ft. bells; two Upright Drills; Brown & Sharpe Milling Machine; Siles & Fowler Press, Nos. 2, 3 and 5; one 600 pound Drop; one 700 pound do.

**ALLIS, BULLARD & CO. (Limited),**  
14 Dey Street, New York.  
**MANUFACTURERS**  
desirous of introducing their goods to the British and Continental Markets, are advised to insert advertisements in the newspaper "IRON," published every Saturday, at 99 Cannon Street, London, E. C.

Scale: First 3 lines, 8¢; every additional line, 10¢. Price, 6¢ per Copy, or 30¢ per annum, inclusive of postage to the United States.  
**American Manufactures in England.**  
A merchant of long experience in Birmingham England, will devote time to the sale of, and to the procuring of orders in the English market for American manufactures. For particulars apply to  
**Office of *The Iron Age*, 10 Warren St., N. Y.**

**SPECIAL NOTICE**  
A new style of  
**MEN'S SINGLE GUNS,**  
in addition to the former line of A. Simon's, Liege, now offered.  
**SILESIA SHEET ZINC,**  
Imported by  
**LOUIS WINDMULLER & ROELKER,**  
20 Reade Street, N. Y.

**Steel Castings.**  
Solid and Homogeneous. Guaranteed tensile strength, 25 tons to square inch. An invaluable substitute for expensive forgings, or for Cast Iron requiring great strength. Send for circular and price list to  
**CHESTER STEEL CASTINGS CO.,**  
Evelina St., Philadelphia, Pa.

**Wanted—A Partner,**  
In a foundry and machine business, already well established. Locality splendid and healthy.  
A practical man with means is wanted to join a practical man who is already well established.  
Address  
**CAR WHEEL FOUNDRY,**  
P. O. Box 134, Selma, Alabama.

**SPECIAL NOTICE.**  
I have three patents for Dies, Machinery and Tools for making Augers and Bits, each running seventeen years; dated as follows: Dec. 19, 1859; January 31, 1860, and July 3, 1866. **There is a special claim on each of the dies.** All persons infringing on said patents will be held responsible to the extent of the law.  
**DEER RIVER, Conn., Sept. 7, 1874.**  
**Russell Jennings.**

**WANTED.**—A first-class business man familiar with machinery and manufacturing, capable of handling large bodies of men, desires a responsible position. References satisfactory. Address,  
**IRON AND STEEL,**  
Care of P. O. Box 813, Bridgeport, Conn.

**Important to Manufacturers.**  
**BISSELL, WELLES & MILLET,**  
Auctioneers and Commission Merchants, No. 15 MERRAY ST., New York.

Solicit from Manufacturers and others consignments of Hardware and Cutlery for our weekly Auction Sales to the Trade, or at private sale for cash, as desired. Our facilities for moving large lines of goods are unsurpassed. Advances made if desired.  
**Wanted, Light T Rail.**

Parties having for sale 50 to 100 tons of slightly worn, 25 to 35 lbs. T. Rail, can find a purchaser at a reasonable price, by addressing (with price delivered in New York or Philadelphia.)  
**D. G. AMBLER, Utica, N. Y.**

**For Sale.**  
**FOR SALE.**  
Buffalo File Factory property, fronting on Niagara Street, Buffalo, N. Y., near Pratt's Iron Works, 198 feet front by half 940 and half 290 feet deep, front feet front by half 940 and half 290 feet deep, with two wings one story high running back near 400 feet, all of brick. Engine, boiler, trip hammer, shafting and appurtenances well appointed for file making, or adapted for any manufacturing business, will be sold low, on easy terms.  
**BENJ. H. AUSTIN,**  
8 & 10 E. Eagle St., Buffalo, N. Y.

**For Sale.**  
A No. 5 Geared Stiles & Parker Press. Perfect order. Quite new. Latest pattern.  
**B. D. WASHBURN & CO., Boston.**

## For Sale, &amp;c.

## HARDWARE, STOVE AND TIN STORE

AT  
**SACRAMENTO, CAL.,**

## For Sale.

A rare opportunity to buy a well established business at a bargain. Apply to  
**HOLBROOK, MERRILL & CO.,**  
113 California St., San Francisco, CAL.  
Or 218 Water St., N. Y.

## BOLT WORKS.

## Cincinnati Bolt Works For Sale.

In consequence of the death of the proprietor, the above Works are offered for sale. The reputation of the goods manufactured is second to none in the country, with a steady demand for them.

The machinery and Works are in complete order, and in full operation. This is a rare opportunity for an Eastern manufacturer to establish a branch in Cincinnati.

Send for samples of bolts.  
Apply to  
**CINCINNATI BOLT WORKS,**  
Cincinnati, O.

Or **SMITH & NIXON.**  
**A Valuable Clay Property FOR SALE.**

There will be sold by order of the Supreme Court, On Tuesday, Nov. 21, 1876, at 11 o'clock, a. m., at the ferry house, Vanderbilt Landing, S. L., under the direction of E. PLATT JOHNSON, Referee, the **Farm, Kaolin Pitts, Trammings and Dock**, of which ABRAHAM ELLIS, late of Staten Island, died, seized, containing about 40 acres, with extensive water front on the S. L. Sound, opposite Woodbridge, New Jersey. The tramway extending from the pits to the dock in front, is a good substantial tramway, built in regular R. R. style and on ties. The deposits of kaolin clay are immense and of the finest quality, and the facilities for digging and shipping are excellent. The farm is well located and very desirable for a residence, and is in all respects healthy.  
**E. PLATT JOHNSON, Referee.**  
For particulars inquire of  
**W. T. ELLIOTT, Attorney,** 71 Broadway, N. Y.

## Nail Mill For Sale.

Situated at Dunleith, Illinois, northern terminus of the Illinois Central R. R., on the Mississippi River, and opposite Dubuque, Iowa, the largest and most flourishing city in the State. This mill is new and has not been run but a few days, and is now offered for sale because the owners know nothing of the business, and for one-half its cost. The capacity of mill is about 80 bags per day, has 6 machines from 3d to 6 inch spikes, 80 horse power engine for rolls and 20 horse-power engine and boiler for nail machines, with heating furnace, ovens, etc., ready for work. Plenty of scrap iron can be obtained at \$18 per ton to run to full capacity; coal at low prices. Nails were made at a cost of \$2-25 per keg. A practical man can establish a first-rate business and buy the works at a bargain. Price \$6000. For further information refer to  
**C. S. BURT, Dunleith, Ill.**

## HARDWARE BUSINESS For Sale.

In a city near New York, doing a good business. Satisfactory reasons given for selling. Address, G.,  
Office of *The Iron Age*, 10 Warren St., N. Y.

## Machinery For Sale.

Having sold our good will and business to the Domestic Sewing Machine Co., we have for sale a large quantity of second-hand Machinery at our manufactory, corner of Waltham and Washington Streets, Boston.  
**GROVER & BAKER SEWING MACHINE CO.**

## FOR SALE.

Valuable patent rights of a Safety Steam Screw Platform Elevator and of a Broom Starching Machine for steam laundries. Can be seen at the United States International Exposition. Also, one-third interest in Plautz's Steel Truss Extension or Flying Bridge. For full particulars address  
**L. STERNBERGER,**  
503 Market St., Philadelphia, Pa.

## MACHINERY FOR SALE.

One new Tank Locomotive 34 inch gauge, cylinders 9 inch bore, 19 inch stroke, drivers with steel tires, weight about 6 tons. Also a second-hand Vertical Engine, 16 inch bore, 16 inch stroke of cylinder, fitted with independent cut-off. All in first-rate order. Address,  
**WARD, STANTON & CO.,**  
Newburg, N. Y.

## FOR SALE.

at 10c. a copy. Weekly Spanish Review and Prices Current. The undersigned is also a **Translator** from and into the English, Spanish, French and German. **Latest Translations made:** for the governments of Germany and Spain, Pacific Mail S. S. Co., Walter A. Wood, Morris, Wheeler & Co.; Todd & Rafferty; John T. Dunkin; Fisk & Hatch; H. W. Wilde; Wilson Sewing Machine Co.; J. Hess & Co.; H. Marguardt; M. Echeverria & Co., and Chas. E. Little, New York; Hocking Valley Mfg. Co.; W. F. Potts, Son & Co., Phila.; Atlantic and Pacific Land Co.; B. E. Flemming, Jersey City; Wilder & Co., Savannah, and the Tanite Co.; Stroudsburg ("Emery Grinder"), Abendroth & Root Mfg. Co., to whom he refers.  
Estimates furnished of translations and setting up of Spanish, German and French Catalogues for the Case of Good Hope and Australian Exhibitions.  
**C. KIRCHHOFF,**  
Metal Reporter of "The Iron Age,"  
Box 3091, New York P. O.



# Trade Report.

Office of THE IRON AGE.

WEDNESDAY EVENING, NOV. 15, 1876.

During the past week the financial markets, as well as the various departments of wholesale trade, have been seriously disturbed by the excitement of the presidential canvass, protracted far beyond the usual period by the uncertainty which attends the official count in the three doubtful states. This fruitful cause of uneasiness and uncertainty, which is necessarily prejudicial to legitimate business of all kinds, has been still further complicated by the telegraphic reports of what Earl Beaconsfield has said on behalf of Great Britain touching the Eastern question, the Czar's very decided utterances on behalf of Russia, and the military preparations in Russia and Great Britain. At the present moment the outlook is decidedly warlike, and if both Beaconsfield and the Czar meant what they have said, it looks very much as if diplomacy had failed to adjust the differences or found a peaceful solution of the question which have so long threatened to bring about the war which now seems inevitable. If England means war without allies, Earl Beaconsfield is evidently placing great reliance upon his ability to put in the field an army composed of the Queen's subjects in India with which to meet the legions of Russia. Such a war would be no child's play, and out of it would grow no one can tell what. Under the circumstances it is not to be wondered that Wall Street is in a nervous, sensitive condition, and that operators have been watchful rather than active. Call loans have ranged 2 @ 4 per cent. on 'Change, and 4 @ 5 per cent. at bank. Mercantile paper is quoted at 4 1/2 @ 6 per cent.

The steadiness of gold has been a matter of general surprise, considering the nature of the influences operating on the market. The advance to 110 1/2 on Wednesday last was not sustained, and it has since ranged between 109 1/2 and 109 3/4. Silver in London is quoted at 54 1/2 @ 54 3/4 per oz., 1000 fine; here it is worth \$1.17 @ \$1.18. The following shows the daily range of the gold premium in this market since our last report:

	Highest.	Lowest.
Thursday.....	109 1/2	109 1/2
Friday.....	109 1/2	109 1/2
Saturday.....	109 1/2	109 1/2
Sunday.....	109 1/2	109 1/2
Monday.....	109 1/2	109 1/2
Tuesday.....	109 1/2	109 1/2
Wednesday.....	109 1/2	109 1/2

Government bonds have been quiet and steady, and the market is without feature. Desirable railway mortgages are steady, but Ohio and Mississippi and the coal road securities have suffered considerable decline. We give below the quotations of governments.

The stock market has been unsettled and excitable, with a downward tendency and little speculation. The principal dealings have been in Western Union, Lake Shore, Michigan Central, D. & W. V. St. Paul and New Jersey Central. We give below the quotations of active shares at the close of business to-day.

The bank statement of Saturday last showed no unexpected changes. The surplus reserve is now \$8,006,335, or \$1,245,840 less than last week. The following is a comparison of the averages for the past two weeks:

The following tables show the foreign trade movements for the week:

For the week ended Nov. 11:

	1874.	1875.	1876.
Total for week.....	\$6,092,737	\$4,133,565	\$3,708,373
Prev. reported.....	\$39,950,807	\$286,169,067	\$45,357,316

Since Jan. 1.....\$346,049,544 \$290,304,632 \$249,125,094

Among the imports of general merchandise were articles valued as follows:

	Quant.	Value.
Anvils.....	133	\$1,241
Bismuth.....	3	1,535
Bronzes.....	8	8,222
Chains and anchors.....	3	133
Copper.....	3	3,645
Cutlery.....	68	18,563
Gun.....	2	2,561
Hardware.....	14	2,571
Iron, pig, tons.....	100	1,743
Iron, sheet, tons.....	25	2,718
Iron cotton line, tons.....	129	3,773
Iron, other, tons.....	129	11,753
Metal goods.....	129	9,608
Nails.....	4	95
Needles.....	30	9,641
Nickel.....	1	1,025
Per. caps.....	7	1,012
Saddlery.....	14	397
Steel.....	14	7,096
Tin, boxes.....	12,619	70,708
Wire.....	285	6,388

EXPORTS, EXCLUSIVE OF SPECIE.

For the week ended Nov. 11:

	1874.	1875.	1876.
Total for week.....	\$5,365,249	\$1,832,890	\$5,431,408
Prev. reported.....	\$50,792,839	\$1,877,592	\$20,219,313

Since Jan. 1.....\$256,158,098 \$222,710,489 \$235,650,721

Among the exports of specie were articles valued as follows:

	1874.	1875.	1876.
Total for week.....	\$5,365,249	\$1,832,890	\$5,431,408
Prev. reported.....	\$50,792,839	\$1,877,592	\$20,219,313

Since Jan. 1.....\$256,158,098 \$222,710,489 \$235,650,721

Among the exports of specie were articles valued as follows:

	1874.	1875.	1876.
Total for week.....	\$5,365,249	\$1,832,890	\$5,431,408
Prev. reported.....	\$50,792,839	\$1,877,592	\$20,219,313

Illinois Central.....	75 1/2	76 3/4
Kansas Pacific.....	2 1/2	3 1/4
Kansas & Texas.....	7	8
Lake Shore.....	54 1/2	55
Michigan Central.....	41 1/2	41 3/4
Morris & Essex.....	41 1/2	41 3/4
Milwaukee & St. Paul.....	19 1/2	19 3/4
Mariposa.....	50 1/2	50 3/4
New York Central.....	101 1/2	101 3/4
New Jersey Central.....	33 1/2	33 3/4
Ohio & Mississippi.....	5 1/2	5 3/4
Pacific Mail.....	24 1/2	24 3/4
Panama.....	127 1/2	127 3/4
Pittsburgh & Fort Wayne.....	101 1/2	101 3/4
Pacific of Missouri.....	10 1/2	10 3/4
Quicksilver.....	14 1/2	14 3/4
St. Louis and Iron Mountain.....	11 1/2	11 3/4
St. L., Kan. City Northern.....	27 1/2	27 3/4
Tol., Wabash & Western.....	6 1/2	6 3/4
Union Pacific.....	59 1/2	59 3/4
Western Union Telegraph.....	72 1/2	72 3/4

## GENERAL HARDWARE.

To the unsettled condition of political affairs is ascribed in a great measure the uniform dullness which pervades almost every branch of trade, and until the presidential election is decided one way or the other little improvement can be expected.

We have before commented on the growing disposition among our merchants to decline the compromise of insolvents unless in cases where it was obvious that honest and competent men were overtaken by financial disaster through causes absolutely beyond their control. The temper of the trade in the matter of insolvent debtors is aptly illustrated by the following circular:

NEW YORK, November 13, 1876.  
As creditors of F. Sturgess & Co., we understand an attempt will be made to induce you to accept a compromise of fifty cents on the dollar, with the assurance that no more can be realized from the estate, and that the majority of the creditors, at a meeting lately held in Chicago, advised this course.

We are convinced the property belonging to the firm will readily pay eighty to ninety cents. If claims to a large amount, which we believe to have no legal foundation, are disallowed, there is no reason why the creditors should not ultimately receive payment in full.

The desire to throw the whole loss upon the creditors, and to allow parties who have shown themselves incompetent, to go on in business with a larger capital than before, is evidently unfair to other merchants who have always paid in full.

We believe it will also tend to demoralize business to a great extent, and we trust you will look carefully into the matter before signing such a paper as proposed.

We are quite willing to take the property of the firm, and to accept in full discharge whatever it will realize; and we ask you to join with us in carrying this out.

PHILIPS, DODGE & CO.,  
NAYLOR & CO.,  
W. S. & N. CAINE,  
THOS. J. POPE & BRO.,  
THE NEW HAVEN CUPPER CO.,  
FRASER, BELL & LOUGHRAN,  
LALANX & GROSSEAN MFG. CO.,  
JAMES, AIKMAN & CO.,  
ANSONIA BRASS AND COPPER CO.

The reduction in the price of Flat Head Iron Wood Screws, announced in our columns last week, has caused a good deal of comment, and the causes that led to it have been freely discussed. The American Screw Company advanced prices in August last, and they inform us that they endeavored to maintain prices until January, for the express purpose of enabling the trade to sell at a profit. Screws purchased at previously low rates, but concessions made by competitors compelled them, in self-defence, to drop prices prematurely.

The following circulars explain themselves:

[Circular No. 5.]

We hereby announce our circular on Screws, dated August 15, 1876. Until further notice we solicit orders for Flat Head Iron Screws upon the following terms: Discount 60 per cent. from our list, cash thirty days. No prices guaranteed.

All orders will be promptly filled from our stock so far as possible, and balances executed at ruling rates at date of shipment.

RUSSELL & ERWIN MFG. CO.  
NEW YORK, November 9, 1876.

TO THE TRADE—GENTLEMEN: Your attention is called to the present discount and terms on United States Screw Co.'s Wood Screws, viz:

Flat Head Iron.....57 1/2 per cent. discount  
Round Head Iron.....40

Terms, Cash 30 days.

Payment to be made in funds par in New York, and if not paid in 30 days, subject to draft at sight.

No guarantee for stock on hand. All ordinary orders will be filled as fully as possible from stock on hand, and after first shipment balance of order will be cancelled. All orders received will be subject to prices ruling at date of shipment. Soliciting a continuance of your patronage, I remain, very respectfully,

CHARLES PARKER.

On the 10th instant the manufacturers of Nails reduced the price from \$3.10 for 10d. to 60d., to \$3. We quote 10d. to 60d., \$3 per keg, net. On orders of 100 kegs and over, taken in one month, a discount of 10 cents per keg is allowed. For California trade special rates have been established. Some large orders for shipment to distant ports have been placed during the week, but the demand for city and near-by trade continues light and unsatisfactory. The following is the \$3 card:

November 10th, 1876.

COMMON, FENCE AND SHEATHING.

Per keg.

10d. and 9d.....\$3.00

8d. and 7d.....\$3.25

6d. and 5d.....\$3.50

4d. and 3d.....\$3.75

3d. and 2d.....\$4.00

COOPERS' SLATING, TOBACCO, WAREHOUSES AND EDGES

GRIP FENCE.

10d. and larger.....\$3.75

8d. and 7d.....\$3.50

6d. and 5d.....\$3.25

4d. and 3d.....\$3.00

3d. and 2d.....\$2.75

Spikes, of all sizes.....\$3.25

10d. and larger.....\$3.75

8d. and 7d.....\$3.50

6d. and 5d.....\$3.25

4d. and 3d.....\$3.00

3d. and 2d.....\$2.75

Fine Finishing, \$1.25 a keg above same size Common.

## CLINCH NAILS.

	Per Keg.	1/2 Kegs.
3 in. and larger.....	\$4.50	\$2.50
2 1/2 in. and 2 1/4 in.....	4.75	2.75
2 in. and 1 3/4 in.....	5.00	2.75
1 1/2 in.....	5.25	2.85
1 in.....	5.50	3.00

The manufacturers of Clothes Wringers have revised their prices and have in press the following reduced lists. The prices quoted are net cash figures for any quantity under ten dozen. To the wholesale trade, in lots of ten dozen and over, a concession from these figures is allowed. Jobbers will be required to adhere to the revised prices, and all goods shipped since November 10 are subject to the new conditions. The "Monitor" has been suppressed by order of the Supreme Court. The following is the revised list of the Metropolitan Washing Machine Co.:

WHOLESALE PRICE LIST, NOVEMBER 10TH, 1876.

	Size of Roll.	Price each.	Price in any quantity.
XX "UNIVERSAL" ROWELL'S. Cog-wheels on Both Ends. Usual Clamp for Round Tubs.			
No. 2, Usual Family size.....	10 1/2	7.50	66.00
No. 1 1/2, Large.....	11 1/2	8.50	74.00

	Size of Roll.	Price each.	Price in any quantity.
XX "UNIVERSAL" ROWELL'S. Cog-wheels on Both Ends. Iron Swing Clamp for Set Tubs.			
No. 2, Usual Family size.....	10 1/2	7.50	66.00
No. 1 1/2, Large.....	11 1/2	8.50	74.00

	Size of Roll.	Price each.	Price in any quantity.
"NATIONAL" Malleable Iron Frame. Rowell's Double Gear. Iron Swing Clamp. Fit Tubs of any thickness.			
No. 2, Usual Family size.....	10 1/2	7.50	66.00
No. 1 1/2, Large.....	11 1/2	8.50	74.00

	Size of Roll.	Price each.	Price in any quantity.
"RELIANCE" With Spiral Gear at both Ends and Monitor Roll. ("All White.") With Curved Clamp for Round Tubs.			
No. 2, Family size.....	10 1/2	7.50	66.00
No. 1 1/2, Large.....	11 1/2	8.50	74.00

	Size of Roll.	Price each.	Price in any quantity.
"HOUSEHOLD" Monitor Roll without Cogs. Adjustable Curved Clamp.			
No. 2, Usual Family size.....	10 1/2	7.50	66.00
No. 1 1/2, Large.....	11 1/2	8.50	74.00

	Size of Roll.	Price each.	Price in any quantity.
"NATIONAL" Malleable Iron Frame. Without Cog Wheels. (Friction.) Iron Swing Clamp. Fit Tubs of any size.			
No. 2, Usual Family size.....	10 1/2	7.50	66.00
No. 1 1/2, Large.....	11 1/2	8.50	74.00

	Size of Roll.	Price each.	Price in any quantity.
"EXTRA UNIVERSAL" ROWELL'S Double Cog Wheels on end. Fit Tubs of any thickness. With Malleable Iron Swing Clamp. Fit Round, Square or Stationary Tubs.			
No. 1, Usual Hotel size.....	12 1/2	12.00	92.00
No. 8, Large.....	14 1/2	16.00	141.00

	Size of Roll.	Price each.	Price in any quantity.
No. 12, Laundry (hand or power).....	14 1/2	35.00	21.00
No. 18, Laundry (hand or power).....	17 1/2	30.00	25.00
No. 22.....	17 1/2	34.00	32.00

TERMS.—Time, 30 days, net, which time can in no case be extended. (No discount for cash.)

No Wringers will be sent out on commission or consignment. We sell Wringers of our own manufacture only. Wringers with purchase gears will no longer be sold by us. Wringers delivered at New York, Boston or Providence.

DOTY'S WASHING MACHINE.

	Retail.	Wholesale.
Family.....	\$14.00	\$9.50
Hotel.....	16.00	11.00

UNION WASHING MACHINE.

	Retail.	Wholesale.
Washer.....	\$18.00	\$12.60
With Wringer.....	27.00	18.50

REPAIRS.—Wringers of all kinds repaired, or parts furnished promptly.

METROPOLITAN WASHING MACHINE CO.,  
R. C. BROWNING, President,  
32 Cortlandt St., N. Y.

We print below the revised price list of the Bailey Wringing Machine Co. This company are doing a large export business in Clothes Wringers and other specialties. For export trade special prices will be given on application. In their advertisement, on page 19, they illustrate some of their leading styles of Clothes Wringers:

Size of Roll.

Length.

Diam.

Retail price.

Wholesale price in any quantity.

NOVELTY WRINGERS.—With Curved Clamp.

Will fit Round or Square Tubs 1 1/4 inches or less thick.

No. 1, Small Family Size.....10 1/2 14 6.50 \$54.00

No. 2, Medium.....10 1/2 17 7.50 66.00

No. 3, Large.....11 1/2 18 8.50 74.00

NOVELTY WRINGERS.—With Straight Clamp.

Will fit Round or Square Tubs 2 inches or less thick.

No. 1 1/2, Small Family Size.....10 1/2 14 6.50 54.00

No. 2 1/2, Medium.....10 1/2 17 7.50 66.00

No. 3 1/2, Large.....11 1/2 18 8.50 74.00

EXCELSIOR WRINGERS.—With Folding Bench.

The most practical and complete Wringer for Round Tubs, into or from either of which the clothes can be wrung by means of the patent tipping board.

No. A, Medium Family Size.....10 1/2 17 9.00 88.00

No. B, Large.....11 1/2 18 10.00 96.00

No. C, Extra Large.....12 1/2 19 11.00 104.00

No. D, Medium Hotel Size.....12 1/2 20 12.00 112.00

No. E, Large.....14 1/2 25 15.00 140.00

EXCELSIOR WRINGERS.—For Stationary Tubs.

Have the Patent Tipping Board for conducting the water into a tub on either side of the Wringer as desired, which saves much hard labor as shifting of the Wringer from the one partition in the set tub to another is necessary. The frames of these Wringers are heavier and stronger than those of other Wringers with same size rolls.

No. E, Medium Family Size.....10 1/2 17 8.00 72.00

No. F, Large.....11 1/2 18 9.00 80.00

No. G, Extra Large.....12 1/2 19 10.00 88.00

No. H, G. Small Hotel Size.....12 1/2 20 10.00 88.00

No. I, Medium.....12 1/2 21 11.00 96.00

No. J, Large.....14 1/2 25 15.00 140.00

POWER WRINGERS.—With Pulleys.

With six steel rods passing lengthwise through the rolls to insure strength and durability.

No. 00, Large Laundry Size.....11 1/2 44 50.00 37.50

No. 000, Large Factory.....15 1/2 55 150.00 150.00

N. B.—All of the above Wringers, excepting Nos. 1 and 1 1/2, have cog wheels. Terms.—Time, thirty days, net, which time can in no case be extended.

We allow no discount for early payment.

Wringers delivered at New York, Boston or Providence.

Repairs.—Wringers of all kinds repaired or parts furnished.

BAILEY WRINGING MACHINE CO.,  
No. 99 Chambers street, New York.

G. B. Walbridge & Co.,



Page.	Dis. per cent.	Page.	Dis. per cent.	Page.	Dis. per cent.	Page.	Dis. per cent.
100, Coffee Mills.	4 5 6	141, Fenn's Patent Faucets.	4 5 6	178, Curry Combs, Fitch's.	4 5 6	217, Wrought Iron Staples.	4 5 6
Nos.	4 5 6	142, Racking Cocks.	4 5 6	179, Curry Combs, Fitch's.	4 5 6	218, Wrought Iron Staples.	4 5 6
Per doz.	4 5 6	143, Plain Bibbs.	4 5 6	180, Curry Combs, Fitch's.	4 5 6	219, Wrought Iron Staples.	4 5 6
Coffee Mills.	4 5 6	144, Petroleum Oil Faucets.	4 5 6	181, Curry Combs, Fitch's.	4 5 6	220, Wrought Iron Staples.	4 5 6
Nos.	4 5 6	145, Change List, Nos. 13 and 14 to	4 5 6	182, Curry Combs, Fitch's.	4 5 6	221, Wrought Iron Staples.	4 5 6
Per doz.	4 5 6	146, Oyster Knives.	4 5 6	183, Curry Combs, Fitch's.	4 5 6	222, Wrought Iron Staples.	4 5 6
Add to list, Parker's French Box Mill, No. 301.	4 5 6	147, Butter and Cheese Trainers.	4 5 6	184, Curry Combs, Fitch's.	4 5 6	223, Wrought Iron Staples.	4 5 6
Coffee Mills, Wilson's Side, No. 1, \$2.75 per	4 5 6	148, Garden Trowels.	4 5 6	185, Curry Combs, Fitch's.	4 5 6	224, Wrought Iron Staples.	4 5 6
doz.	4 5 6	149, Garden Trowels.	4 5 6	186, Curry Combs, Fitch's.	4 5 6	225, Wrought Iron Staples.	4 5 6
110, Coffee Mills, Eagle.	4 5 6	150, Brass Kettles.	4 5 6	187, Curry Combs, Fitch's.	4 5 6	226, Wrought Iron Staples.	4 5 6
Nos.	4 5 6	151, Police Lanterns.	4 5 6	188, Curry Combs, Fitch's.	4 5 6	227, Wrought Iron Staples.	4 5 6
Per doz.	4 5 6	152, Miner's Lamps.	4 5 6	189, Curry Combs, Fitch's.	4 5 6	228, Wrought Iron Staples.	4 5 6
Coffee Mills, Increase Wilson's.	4 5 6	153, Change List, Nos. 13 and 14 to	4 5 6	190, Curry Combs, Fitch's.	4 5 6	229, Wrought Iron Staples.	4 5 6
Nos.	4 5 6	154, Lanterns, with Guards.	4 5 6	191, Curry Combs, Fitch's.	4 5 6	230, Wrought Iron Staples.	4 5 6
Per doz.	4 5 6	155, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	192, Curry Combs, Fitch's.	4 5 6	231, Wrought Iron Staples.	4 5 6
Adams, Kaughphy Mills.	4 5 6	156, Add Tempest Lanterns, with Chains.	4 5 6	193, Curry Combs, Fitch's.	4 5 6	232, Wrought Iron Staples.	4 5 6
Nos.	4 5 6	157, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	194, Curry Combs, Fitch's.	4 5 6	233, Wrought Iron Staples.	4 5 6
Per doz.	4 5 6	158, Add Tempest Lanterns, with Chains.	4 5 6	195, Curry Combs, Fitch's.	4 5 6	234, Wrought Iron Staples.	4 5 6
111, Coffee and Spice Mills.	4 5 6	159, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	196, Curry Combs, Fitch's.	4 5 6	235, Wrought Iron Staples.	4 5 6
Family Glue Pot.	4 5 6	160, Add Tempest Lanterns, with Chains.	4 5 6	197, Curry Combs, Fitch's.	4 5 6	236, Wrought Iron Staples.	4 5 6
112, Molasses and Oil Gates.	4 5 6	161, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	198, Curry Combs, Fitch's.	4 5 6	237, Wrought Iron Staples.	4 5 6
Measuring Faucets.	4 5 6	162, Add Tempest Lanterns, with Chains.	4 5 6	199, Curry Combs, Fitch's.	4 5 6	238, Wrought Iron Staples.	4 5 6
113, No. 900, Steelyards, Steel Bar.	4 5 6	163, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	200, Curry Combs, Fitch's.	4 5 6	239, Wrought Iron Staples.	4 5 6
Pounds.	4 5 6	164, Add Tempest Lanterns, with Chains.	4 5 6	201, Curry Combs, Fitch's.	4 5 6	240, Wrought Iron Staples.	4 5 6
Per doz.	4 5 6	165, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	202, Curry Combs, Fitch's.	4 5 6	241, Wrought Iron Staples.	4 5 6
No. 900, Steelyards, Iron Bar, 50 pounds, per	4 5 6	166, Add Tempest Lanterns, with Chains.	4 5 6	203, Curry Combs, Fitch's.	4 5 6	242, Wrought Iron Staples.	4 5 6
doz.	4 5 6	167, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	204, Curry Combs, Fitch's.	4 5 6	243, Wrought Iron Staples.	4 5 6
Add to list, Roger's English Steelyards.	4 5 6	168, Add Tempest Lanterns, with Chains.	4 5 6	205, Curry Combs, Fitch's.	4 5 6	244, Wrought Iron Staples.	4 5 6
Pounds.	4 5 6	169, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	206, Curry Combs, Fitch's.	4 5 6	245, Wrought Iron Staples.	4 5 6
Cent.	4 5 6	170, Add Tempest Lanterns, with Chains.	4 5 6	207, Curry Combs, Fitch's.	4 5 6	246, Wrought Iron Staples.	4 5 6
114, Hale's Meat Cutters.	4 5 6	171, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	208, Curry Combs, Fitch's.	4 5 6	247, Wrought Iron Staples.	4 5 6
Perry's	4 5 6	172, Add Tempest Lanterns, with Chains.	4 5 6	209, Curry Combs, Fitch's.	4 5 6	248, Wrought Iron Staples.	4 5 6
Meat and Vegetable Choppers.	4 5 6	173, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	210, Curry Combs, Fitch's.	4 5 6	249, Wrought Iron Staples.	4 5 6
Each.	4 5 6	174, Add Tempest Lanterns, with Chains.	4 5 6	211, Curry Combs, Fitch's.	4 5 6	250, Wrought Iron Staples.	4 5 6
115, Haven's Meat Cutters.	4 5 6	175, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	212, Curry Combs, Fitch's.	4 5 6	251, Wrought Iron Staples.	4 5 6
Extra Meat Cutters.	4 5 6	176, Add Tempest Lanterns, with Chains.	4 5 6	213, Curry Combs, Fitch's.	4 5 6	252, Wrought Iron Staples.	4 5 6
116, Railroad Sausage Filler, Change List to \$15	4 5 6	177, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	214, Curry Combs, Fitch's.	4 5 6	253, Wrought Iron Staples.	4 5 6
per doz.	4 5 6	178, Add Tempest Lanterns, with Chains.	4 5 6	215, Curry Combs, Fitch's.	4 5 6	254, Wrought Iron Staples.	4 5 6
Rice's Sausage Filler, \$12 each.	4 5 6	179, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	216, Curry Combs, Fitch's.	4 5 6	255, Wrought Iron Staples.	4 5 6
117, Perry's Sausage Filler.	4 5 6	180, Add Tempest Lanterns, with Chains.	4 5 6	217, Curry Combs, Fitch's.	4 5 6	256, Wrought Iron Staples.	4 5 6
Cake Turners.	4 5 6	181, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	218, Curry Combs, Fitch's.	4 5 6	257, Wrought Iron Staples.	4 5 6
Cake Baking Pans.	4 5 6	182, Add Tempest Lanterns, with Chains.	4 5 6	219, Curry Combs, Fitch's.	4 5 6	258, Wrought Iron Staples.	4 5 6
118, Steak Hammer.	4 5 6	183, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	220, Curry Combs, Fitch's.	4 5 6	259, Wrought Iron Staples.	4 5 6
Beef Pounders.	4 5 6	184, Add Tempest Lanterns, with Chains.	4 5 6	221, Curry Combs, Fitch's.	4 5 6	260, Wrought Iron Staples.	4 5 6
Beatty's Cleavers.	4 5 6	185, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	222, Curry Combs, Fitch's.	4 5 6	261, Wrought Iron Staples.	4 5 6
Choppers.	4 5 6	186, Add Tempest Lanterns, with Chains.	4 5 6	223, Curry Combs, Fitch's.	4 5 6	262, Wrought Iron Staples.	4 5 6
119, Mining Knives, Change List.	4 5 6	187, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	224, Curry Combs, Fitch's.	4 5 6	263, Wrought Iron Staples.	4 5 6
Nos.	4 5 6	188, Add Tempest Lanterns, with Chains.	4 5 6	225, Curry Combs, Fitch's.	4 5 6	264, Wrought Iron Staples.	4 5 6
Per doz.	4 5 6	189, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	226, Curry Combs, Fitch's.	4 5 6	265, Wrought Iron Staples.	4 5 6
Tobacco Cutters, Change List, No. 1 to \$10 per	4 5 6	190, Add Tempest Lanterns, with Chains.	4 5 6	227, Curry Combs, Fitch's.	4 5 6	266, Wrought Iron Staples.	4 5 6
doz.	4 5 6	191, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	228, Curry Combs, Fitch's.	4 5 6	267, Wrought Iron Staples.	4 5 6
Add No. 3, \$9 per doz.	4 5 6	192, Add Tempest Lanterns, with Chains.	4 5 6	229, Curry Combs, Fitch's.	4 5 6	268, Wrought Iron Staples.	4 5 6
120, Griddles.	4 5 6	193, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	230, Curry Combs, Fitch's.	4 5 6	269, Wrought Iron Staples.	4 5 6
Ice Cream Freezers, Change List Per	4 5 6	194, Add Tempest Lanterns, with Chains.	4 5 6	231, Curry Combs, Fitch's.	4 5 6	270, Wrought Iron Staples.	4 5 6
Quarts.	4 5 6	195, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	232, Curry Combs, Fitch's.	4 5 6	271, Wrought Iron Staples.	4 5 6
Each.	4 5 6	196, Add Tempest Lanterns, with Chains.	4 5 6	233, Curry Combs, Fitch's.	4 5 6	272, Wrought Iron Staples.	4 5 6
Ice Cream Freezers, 1 X L Confectioners.	4 5 6	197, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	234, Curry Combs, Fitch's.	4 5 6	273, Wrought Iron Staples.	4 5 6
121, Clothes Line Wire.	4 5 6	198, Add Tempest Lanterns, with Chains.	4 5 6	235, Curry Combs, Fitch's.	4 5 6	274, Wrought Iron Staples.	4 5 6
Feet.	4 5 6	199, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	236, Curry Combs, Fitch's.	4 5 6	275, Wrought Iron Staples.	4 5 6
Cent.	4 5 6	200, Add Tempest Lanterns, with Chains.	4 5 6	237, Curry Combs, Fitch's.	4 5 6	276, Wrought Iron Staples.	4 5 6
122, Clothes Wringers, Eureka, \$60 per doz.	4 5 6	201, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	238, Curry Combs, Fitch's.	4 5 6	277, Wrought Iron Staples.	4 5 6
For quantity, write for price.	4 5 6	202, Add Tempest Lanterns, with Chains.	4 5 6	239, Curry Combs, Fitch's.	4 5 6	278, Wrought Iron Staples.	4 5 6
123, Drinking Cups, Retained.	4 5 6	203, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	240, Curry Combs, Fitch's.	4 5 6	279, Wrought Iron Staples.	4 5 6
Dippers, Stamped.	4 5 6	204, Add Tempest Lanterns, with Chains.	4 5 6	241, Curry Combs, Fitch's.	4 5 6	280, Wrought Iron Staples.	4 5 6
124, Dippers, Retained.	4 5 6	205, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	242, Curry Combs, Fitch's.	4 5 6	281, Wrought Iron Staples.	4 5 6
Sauce Pans, Retained.	4 5 6	206, Add Tempest Lanterns, with Chains.	4 5 6	243, Curry Combs, Fitch's.	4 5 6	282, Wrought Iron Staples.	4 5 6
125, Stamped Pans, Straight.	4 5 6	207, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	244, Curry Combs, Fitch's.	4 5 6	283, Wrought Iron Staples.	4 5 6
Wash Bowls, Stamped, Change List.	4 5 6	208, Add Tempest Lanterns, with Chains.	4 5 6	245, Curry Combs, Fitch's.	4 5 6	284, Wrought Iron Staples.	4 5 6
Nos.	4 5 6	209, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	246, Curry Combs, Fitch's.	4 5 6	285, Wrought Iron Staples.	4 5 6
Per doz.	4 5 6	210, Add Tempest Lanterns, with Chains.	4 5 6	247, Curry Combs, Fitch's.	4 5 6	286, Wrought Iron Staples.	4 5 6
126, Dish Pan, Retained.	4 5 6	211, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	248, Curry Combs, Fitch's.	4 5 6	287, Wrought Iron Staples.	4 5 6
Corn Poppers, Change List, Patent Reversible,	4 5 6	212, Add Tempest Lanterns, with Chains.	4 5 6	249, Curry Combs, Fitch's.	4 5 6	288, Wrought Iron Staples.	4 5 6
\$3.50 per doz.	4 5 6	213, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	250, Curry Combs, Fitch's.	4 5 6	289, Wrought Iron Staples.	4 5 6
Square Wire Handle, \$2 per doz.	4 5 6	214, Add Tempest Lanterns, with Chains.	4 5 6	251, Curry Combs, Fitch's.	4 5 6	290, Wrought Iron Staples.	4 5 6
127, Boasting Spoon, Retained.	4 5 6	215, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	252, Curry Combs, Fitch's.	4 5 6	291, Wrought Iron Staples.	4 5 6
Iron Tea and Table Spoons.	4 5 6	216, Add Tempest Lanterns, with Chains.	4 5 6	253, Curry Combs, Fitch's.	4 5 6	292, Wrought Iron Staples.	4 5 6
Measures.	4 5 6	217, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	254, Curry Combs, Fitch's.	4 5 6	293, Wrought Iron Staples.	4 5 6
128, Funnel.	4 5 6	218, Add Tempest Lanterns, with Chains.	4 5 6	255, Curry Combs, Fitch's.	4 5 6	294, Wrought Iron Staples.	4 5 6
Egg Beaters.	4 5 6	219, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	256, Curry Combs, Fitch's.	4 5 6	295, Wrought Iron Staples.	4 5 6
Water Coolers.	4 5 6	220, Add Tempest Lanterns, with Chains.	4 5 6	257, Curry Combs, Fitch's.	4 5 6	296, Wrought Iron Staples.	4 5 6
129, Scoops, Change List, No. 5, Plain Tin to	4 5 6	221, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	258, Curry Combs, Fitch's.	4 5 6	297, Wrought Iron Staples.	4 5 6
\$1.65.	4 5 6	222, Add Tempest Lanterns, with Chains.	4 5 6	259, Curry Combs, Fitch's.	4 5 6	298, Wrought Iron Staples.	4 5 6
130, Bowls and Pitchers.	4 5 6	223, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	260, Curry Combs, Fitch's.	4 5 6	299, Wrought Iron Staples.	4 5 6
Chamber Brooms.	4 5 6	224, Add Tempest Lanterns, with Chains.	4 5 6	261, Curry Combs, Fitch's.	4 5 6	300, Wrought Iron Staples.	4 5 6
Dust Pans.	4 5 6	225, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	262, Curry Combs, Fitch's.	4 5 6	301, Wrought Iron Staples.	4 5 6
131, Toilet Sets.	4 5 6	226, Add Tempest Lanterns, with Chains.	4 5 6	263, Curry Combs, Fitch's.	4 5 6	302, Wrought Iron Staples.	4 5 6
Paint Brushes, Round or Oval.	4 5 6	227, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	264, Curry Combs, Fitch's.	4 5 6	303, Wrought Iron Staples.	4 5 6
Flat.	4 5 6	228, Add Tempest Lanterns, with Chains.	4 5 6	265, Curry Combs, Fitch's.	4 5 6	304, Wrought Iron Staples.	4 5 6
132, Varnish Brushes.	4 5 6	229, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	266, Curry Combs, Fitch's.	4 5 6	305, Wrought Iron Staples.	4 5 6
Whitewash Brushes, All Bristles.	4 5 6	230, Add Tempest Lanterns, with Chains.	4 5 6	267, Curry Combs, Fitch's.	4 5 6	306, Wrought Iron Staples.	4 5 6
Per doz.	4 5 6	231, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	268, Curry Combs, Fitch's.	4 5 6	307, Wrought Iron Staples.	4 5 6
133, Plasterers' Brushes, 3 Row, all Bristles.	4 5 6	232, Add Tempest Lanterns, with Chains.	4 5 6	269, Curry Combs, Fitch's.	4 5 6	308, Wrought Iron Staples.	4 5 6
No. 1, 8 1/2 in., per doz.	4 5 6	233, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	270, Curry Combs, Fitch's.	4 5 6	309, Wrought Iron Staples.	4 5 6
No. 2, 9 1/2 in., per doz.	4 5 6	234, Add Tempest Lanterns, with Chains.	4 5 6	271, Curry Combs, Fitch's.	4 5 6	310, Wrought Iron Staples.	4 5 6
Sweeping Brushes.	4 5 6	235, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	272, Curry Combs, Fitch's.	4 5 6	311, Wrought Iron Staples.	4 5 6
Change Nos. 7, 8, 9, 10, to new Nos. 1, 2, 3, 4.	4 5 6	236, Add Tempest Lanterns, with Chains.	4 5 6	273, Curry Combs, Fitch's.	4 5 6	312, Wrought Iron Staples.	4 5 6
Dusting Brushes.	4 5 6	237, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	274, Curry Combs, Fitch's.	4 5 6	313, Wrought Iron Staples.	4 5 6
Change Nos. 14, 15, 16, 17, to new Nos. 1, 2, 3, 4.	4 5 6	238, Add Tempest Lanterns, with Chains.	4 5 6	275, Curry Combs, Fitch's.	4 5 6	314, Wrought Iron Staples.	4 5 6
Scrub Brushes, Handled.	4 5 6	239, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	276, Curry Combs, Fitch's.	4 5 6	315, Wrought Iron Staples.	4 5 6
Nos.	4 5 6	240, Add Tempest Lanterns, with Chains.	4 5 6	277, Curry Combs, Fitch's.	4 5 6	316, Wrought Iron Staples.	4 5 6
Per doz.	4 5 6	241, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	278, Curry Combs, Fitch's.	4 5 6	317, Wrought Iron Staples.	4 5 6
134, Shoe Brushes, Handled.	4 5 6	242, Add Tempest Lanterns, with Chains.	4 5 6	279, Curry Combs, Fitch's.	4 5 6	318, Wrought Iron Staples.	4 5 6
Nos.	4 5 6	243, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	280, Curry Combs, Fitch's.	4 5 6	319, Wrought Iron Staples.	4 5 6
Per doz.	4 5 6	244, Add Tempest Lanterns, with Chains.	4 5 6	281, Curry Combs, Fitch's.	4 5 6	320, Wrought Iron Staples.	4 5 6
135, Horse Brushes, Leather Back.	4 5 6	245, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	282, Curry Combs, Fitch's.	4 5 6	321, Wrought Iron Staples.	4 5 6
Nos.	4 5 6	246, Add Tempest Lanterns, with Chains.	4 5 6	283, Curry Combs, Fitch's.	4 5 6	322, Wrought Iron Staples.	4 5 6
Per doz.	4 5 6	247, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	284, Curry Combs, Fitch's.	4 5 6	323, Wrought Iron Staples.	4 5 6
136, Tack Claws, Cast Steel.	4 5 6	248, Add Tempest Lanterns, with Chains.	4 5 6	285, Curry Combs, Fitch's.	4 5 6	324, Wrought Iron Staples.	4 5 6
Dumb Bells.	4 5 6	249, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	286, Curry Combs, Fitch's.	4 5 6	325, Wrought Iron Staples.	4 5 6
Root Jacks, Change List.	4 5 6	250, Add Tempest Lanterns, with Chains.	4 5 6	287, Curry Combs, Fitch's.	4 5 6	326, Wrought Iron Staples.	4 5 6
Nos.	4 5 6	251, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	288, Curry Combs, Fitch's.	4 5 6	327, Wrought Iron Staples.	4 5 6
Per doz.	4 5 6	252, Add Tempest Lanterns, with Chains.	4 5 6	289, Curry Combs, Fitch's.	4 5 6	328, Wrought Iron Staples.	4 5 6
137, Foot Scrapers, Change List, No. 1 to \$2.25 per	4 5 6	253, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	290, Curry Combs, Fitch's.	4 5 6	329, Wrought Iron Staples.	4 5 6
doz.	4 5 6	254, Add Tempest Lanterns, with Chains.	4 5 6	291, Curry Combs, Fitch's.	4 5 6	330, Wrought Iron Staples.	4 5 6
138, Fluting Machine.	4 5 6	255, No. 52, with 3 Burners, \$5.50 per dozen.	4 5 6	292, Curry Combs, Fitch's.	4 5 6	331, Wrought Iron Staples.	4 5 6



Page.	Dis. per cent.
356, Metal Head Spike Glmets.	25.65
356, Clark's Expansive Bits.	10.10
356, 357, Marking Gauges.	45.65
357, Measuring Tapes.	12.12
358, Surveyor's Measuring Tapes, Change List.	12.12
Feet, 50, 65, 75, 100	
Per doz., \$3.98, 5.60, 49.00	
Spring Tape Measures.	25.65
Iron and Steel Squares.	10.10
No. 3 Nickel Plated Steel Squares, per dozen	\$21.50
359, 361, Boxwood Rules.	60.610
361, Board Measures.	60.610
362, Ivory Rules.	50.610
Wing Calipers.	20.20
Compasses.	20.20
Wing Dividers.	35.610
Side Cutting Pliers.	7.12
363, Flat and Round Nose Pliers.	12.12
clusive.	3 to 4 1/2 in. Same price
Button's Patent Pliers.	25.65
Front Cutting Nippers.	7.12
4 to 5 in. incl.	
Nail Sets, Change List, Cast Steel Nail Sets, as sorted, to 60c. per dozen.	20.20
T Bevels, No. 2.	45.65
364, Try Squares.	45.65
Miter Squares, Change List, No. 3 to \$7.00 per dozen.	15.15
Plumb and Levels.	60.65
365, Pocket Levels, No. 40 and 41.	50.65
Level Glasses.	60.65
Tramm 1 Points.	60.65
Beechwood Spoke Shaves.	10.10
Bradbury's Spoke Shaves.	10.10
Iron Spoke Shaves, Nos. 1 and 3.	5.5
366, Spoke Shaves, Nos. 51 to 60.	30.65
366, Sandusky Bench Planes.	50.50
Ogontz Bench Planes.	50.50
Sandusky Miter Planes.	35.35
367, Sandusky Bevel Planes.	35.35
368, Match Planes, Change List so that it shall read per pair.	35.35
Sandusky Plane Plows, Change Nos. to read from 117 to 119.	30.30
Sandusky Skew Rabbit Planes.	30.30
Plane Irons.	10.10
Plane Handles.	25.25
Bench Hooks, Change List of Hotchkiss' Hooks, to \$5.88 per doz.	25.25
369, 370, Bailey's Patent Planes.	25.25
370, No. 110 Iron Block Planes.	25.25
Miller's Combination Planes, Nos. 41 to 44.	25.25
371, Patent Planes, Nos. 46 to 48.	25.25
Miter Boxes.	20.20
Saw Handles.	20.20
372, Oiler, Automatic.	40.65
Oiler, Machine.	40.65
Washita Oil Saws.	30.65
Hindostan Stones and Slips.	20.65
Sand Stones.	20.65
373, Scanlanian Locks.	25.25
Dog Collars.	10.10
374, Awl, Change List, Patent Sewing Awl, \$1.80 per gross.	40.65
Saddlers' Awl, \$2.65 per gross.	40.65
Ad Shoulder Brad Awls, \$3.50 per gross.	40.65
Awl Hfts., Nos. 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.	
Patent Awl Hfts., Nos. 5 to 6 1/2.	40.65
375, Spring Punches.	15.15
Shoe Peg Breaks, Change List, Standard, with Solid Steel Cutters, to \$2.50 each, No. 1.	30.30
to \$2.75 per doz.	
Shoe Knives.	30.30
Warehouse Hatchets.	5.5
376, Box Scrapers.	10.10
Box Openers.	16.16
Nail Grips and Claws, Change List, Double (very large) to \$1.65 each.	35.35
Alarm Money.	12.12
377, Iron Jack Chain.	50.610
Brass.	40.610
Providence Hand Cuffs, Change List to \$15.00 per doz.	5.5
Providence Leg Irons, Change List to \$25 per doz.	5.5
Providence Nickel Plated Police Nippers.	15.15
Purty Knives.	15.15
378, Saws, Diston's Hand, Panel and Rip, Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.	
Saws, Gentlemen's Panel, Nos. 3 and 7.	12.12
Bishop's No. 1.	12.12
"Brown's No. 3.	12.12
"Ellipse.	25.25
"Dexter, Change List to \$11.50 per doz.	25.25
379, Saws, Diston's Hand, Panel and Rip, Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.	
"Jack-on's Back, No. 12.	12.12
"Diston's." After No. 7 to No. 4.	12.12
Change List of No. 4.	12.12
Inches.	15.15
Per doz., \$15.00 18.00 21.00 24.00	
380, Woodruff and McParlin's Pruning Saws.	12.12
Diston's Kitchen Saws.	12.12
"Saw Table.	12.12
"One Man Cross Cut Saws.	12.12
Woodruff and McParlin's Butcher's Bow Saws.	10.65
Saw Rods.	10.65
Inches.	22.22
No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.	
Wood Saws.	92.92
Eagle, Diston's No. 6.	7.75
Per doz.	7.75
Add Boynton's Lightning, \$8 per doz.	25.10
Wood Saw Frames.	25.10
Diston's Wood Saw Blades.	12.12
Coopers' Webs.	12.12
381, Tanning Webs.	20.20
Felloe Webs.	20.20
Bow Saw Blades.	15.15
Power Saws.	30.30
Electric Cross Cut Saws, Woodruff and McParlin's.	12.12
Im's, 4c. per foot.	12.12
Diston's, 50c. per foot.	12.12
Champion Cross Cut Saws, Woodruff and McParlin's, 42c. per foot.	12.12
382, Common-tooth Cross Cut Saws, Woodruff and McParlin's, 36c. per foot.	12.12
Single Hook Cross Cut Saws, Lippincott's or W. & M.P.'s, 36c. per foot.	12.12
Diston's, 42c. per foot.	12.12
Double Hook Cross Cut Saws, Woodruff and McParlin's, 42c. per foot.	12.12
Lippincott's Lightning Cross Cut Saws, 42c. per foot.	12.12
Lippincott's Cross Cut Saws, Self-Gumming, 42c. per foot.	12.12
Boynton's Lightning X Cut Saws, 42c. per foot.	12.12
383, Cross Cut Saw Handles.	40.40
Change List, Climax to 75c. per pair.	40.40
"Plain Hickory, 75c. per doz.	40.40
Saw Pads.	20.20
Nash's Saw Sets.	20.20
Lever.	10.65
Stillman's Saw Sets, Change List, Imitation to \$3 per doz.	10.65
Alken's Pattern Hammer, Saw Set, Change List of the Cast Steel to \$2.25 per doz.	15.15
Alken's Genuine Saw Sets, Change List to \$14.50 per doz.	40.40
384, Hotchkiss Hammer Saw Sets.	5.5
Saw Screws.	12.12
Hand Rail Screws.	25.65
Axe Handles.	20.65
Broad Axe Handles.	20.65
Adze Handles.	20.65
Pick.	40.65
385, Sledge Handles, Change List, Inches, 24, 30 to \$1.75, \$2 per doz.	25.25
Hatchet Handles.	25.25
Hammer. Change List, 16 in. to \$1.40 per doz.	30.30
No. 1, Fork, Rake and Hoe Handles.	20.20
No. 2, 6 foot Hay Fork Handles, \$1.75 per doz.	40.40
No. 2, 4 1/2 " Long Manure Fork Handles, \$4 per doz.	40.40
No. 2, Planters' Hoe Handles, \$2.20 per doz.	40.40
No. 1, Shovel, Spade and Scoop Handles.	20.20
No. 2, Long Bent Shovel Handles, \$2.50 per doz.	40.40
386, Noble's Pat. Drawing Knives.	10.10
386, Barton's Drawing Knives.	10.10
Farmers' Drawing Knives.	60.610
Parr's Razor Blade Drawing Knives.	17.17
Hunt's Adzes.	17.17
P. and G. Mfg. Co.'s Adzes.	25.25
Hunt's Grub Hoes.	17.17
Excelsior Grub Hoes.	25.25
Hunt's Mattocks.	25.25
Excelsior Mattocks.	25.25
387, Tamping Picks, Solid Steel Tamers.	15.15
R. R. Picks.	35.35
Solid Cast Steel Latching Hatchets.	5.5
H. and G. Mfg. Co.'s Latching and Halt Hatchets, Change List.	17.17
No. 2, Half Hatchets, to \$8.50 per doz.	17.17
388, Hunt's Hatchets.	17.17
P. and G. Mfg. Co.'s Shingling and Claw	

Copper is offering, and manufacturers would not doubt be quite willing to avail themselves of current figures in order to replenish supplies, but the as yet quite moderate demand for their goods keeps them in check. Aside from this the uncertainty as to who is to be finally declared the president elect does a deal of harm to general business, and many a want of metals prefer to delay their purchases as much as possible, in hopes of soon being able to see more clearly which way we are drifting in national politics. Baltimore we quote 20 1/2 c.; Lake Superior closes at 20c. @ 20 1/2 c. In Futures nothing has been done. London has worked itself into a speculative excitement once more, Best Selected rising £3 during the week, and Chili Bars £1. 10; the quotation by cable is now £86 for the former and £78 for the latter. English mail accounts have come to hand to the 2d inst., and read as follows: "All through the month different holders' ideas have varied from £1 to £3 per ton, and our quotations only show the views of the lower sellers; the market closes firm. We quote: Tough Ingots, £82; Best Selected, £83, and Manufactured Sheets and Bots, £89." No change has occurred in the demand for manufactures, which we quote 31c. for Sheathling, and 32c. for Bolts and Braziers; New Yellow Metal Sheathing, 18 1/2 c. @ 19c., and Yellow Metal Bolts, 26c. @ 28c., net cash.

**Tin.**—The London market has steadily improved till Straits Tin had reached £78. 10/ @ £79, from which extreme figures there has been a recoil to-day to £78. The cable di-patch adds: "Speculation subsiding." At Singapore, at last accounts, Tin ruled \$21.60, with an exchange of 4 3/4 c. Whether the advance at London will take another start is as yet doubtful, as it will depend on the political developments in the East on the one hand, and the result of the coming auction in Holland on the other. If there is soon to be war between Russia and Turkey, the money markets will get disturbed, and trade in Europe will be checked in many important quarters; and as Tin is wanted for peaceful industry and not for war, we do not see that the troubles in the East can do it any good. Here we are differently situated; all we want is to see trade revive on a safe basis, and Tin will take care of itself, the consumption being fair, and the visible supply a reduced one. In sympathy with the European advance we have been looking up here, although by no means active, and quote in gold, large lines: Straits, 17 1/2 c. @ 18c.; English Refined, 18c.; ditto Common, 17 1/2 c. @ 17 3/4 c.; and Banca, 19 1/2 c. @ 20c. English accounts by mail reach us to the 2d instant, and merely remark that the October improvement of £2 is maintained, and that the market closes with considerable firmness at £74. 10/ for Straits. Very little has transpired in Tin Plates, and we quote as heretofore, gold, per box, large lines, ordinary brands: Charcoal Bright, \$6.75 @ \$7; do. Teraces, \$6.25 @ \$6.50; Coke Tin, \$6 @ \$6.25; and do. Teraces, \$5.50. From Liverpool, under date of 2d instant, they report to the following effect: "A fair number of Coke Tin orders have been placed the past month at the concessions offered by makers, but in other descriptions there has been an almost total absence of trade. Those manufacturers whose make is confined to Charcoals are feeling this stagnation especially keenly, and the prices some of them are prepared to take are accordingly very low. For deliveries ahead, though higher figures are named, to-day's quotations, with a little pressure, could be worked."

**Lead.**—Of Common Domestic some 100 tons are reported sold at 6c. @ 6.05c., currency, in lots. Several arrivals have we are told, been offered at 6c., currency, but not finding buyers have gone into store. The market closes flat at nominally 6c. @ 6.10c., currency. Missouri we quote, 6.15c., currency, nominally, delivered here. For Selected ditto, no price can be named, as it is not salable at present. Foreign is quiet at 6 1/2 c. @ 6 3/4 c., gold. English accounts are up to the 2d instant, and we extract therefrom the following: "Large contracts having during the past few weeks been made for war material, prices of Pig have advanced from 12 1/2 to 15/ per ton. Although the demand has been somewhat checked by the advance, this fact cannot for some time tell on prices, as smelters have only small quantities to dispose of, and ore is arriving sparingly." Manufactured remains in moderate request at 8 1/2 c. for Bar, 9c. for Pipe, and 9 1/2 c. for Sheet, less the usual discount to the trade.

**Spelter and Zinc.**—Domestic Spelter is very dull. A great deal of anxiety is manifested by Western producers to dispose of their accumulating stocks, and several smelters have come East personally trying to effect sales, but as a general thing this move on their part has not been attended with success. They have offered their Spelter as low as 6 1/2 c., currency, delivered here, but in order to effect sales they would have to reduce their asking figure 1/2 c. @ 1/2 c. The Western Combination, which was broken up the other day, ended, it would seem, in mutual reproaches, and it will in all likelihood be some time ere something of the kind is attempted again. Foreign Spelter is inactive and nominal at 7c., gold. There is nothing new from the Continent. Sheet Zinc, the market is more active at 8 1/2 c. @ 8 3/4 c., gold, for Mosselmann, and 8 1/2 c. @ 9c., currency, for American.

**Antimony** has been rather more neglected during the week, and we cannot quote the same over 14 1/2 c. @ 14 3/4 c., gold. London remains quite steady at 25c.

**OLD METALS, PAPER STOCK, &c.**—We have nothing new to report in the condition of the Old Metal market since last week. Business continues very dull and prices remain nominally unchanged. The market for Rags and Paper Stock has improved considerably since last week, and some grades of Rags are in active demand. White Rags, Nos. 1 and 2, and also "Seconds," are well sought for, and are selling at the regular market quotations. We quote the following as the current purchasing rates:

**Old Metals.**—Copper, 14c. @ 15c. per lb.; Yellow Metal, 10c.; Brass, 9c. @ 9 1/2 c.; Composition, heavy, 11c. @ 12c.; Lead, solid, 5c.; Tea Lead, 4c.; Zinc, 4c.; Pewter, No. 1, 12c.; to, No. 2, 8c.; Spelter, 5 1/2 c.; Wrought Iron, \$21 per ton; Light do., \$9 per ton; Stove Plate, \$9 per ton; Machinery, do., \$11 per ton; Burnt Iron, \$4 per ton.

**Rags, &c.**—Canvas, Linen, 4 1/2 c. @ 5 1/4 c.; do. Cotton, No. 1, 5 1/2 c.; No. 2, 2 1/2 c.; White, No. 1, 5c.; No. 2, 4c.; Colored, do., 2c.; Mixed, W-olen, 2c. @ 3c.; Soft, do., 5c.; Gumy Bagging, 1 1/2 c.; Jute Butts, 1 1/2 c. @ 2c.; Kentucky Bagging, 3c.; Book Stock, 3 1/2 c.; Newspaper Stock, 2 1/2 c.; Waste Paper and Scraps, 1 1/2 c.; Kentucky Bale Rope, 4c.; Oakum Junk, No. 1, 1 1/2 c. @ 1 1/4 c.; do. No. 2, 3c.; Tarred Shaking, 1c. @ 1 1/2 c.; Grass Rope, 3c.

## EXPORTS

### Of Hardware, Iron, Machinery, Metals, &c., from the Port of New York, for the Week ending November 14, 1876:

Danish West Indies	Quant. Value.	British North American Colonies	Quant. Value.
Hdw., pkgs., 26	\$114	Iron ore, tons, 62	\$348
Nails, kegs., 180	655	Hdw., cs., 57	1,310
		Mf. iron, pkgs., 49	1,179
<b>Hamburg.</b>		<b>British West Indies.</b>	
Mf. iron, pkgs., 20	601	Mf. iron, pkgs., 59	106
Hardware, cs., 116	3,304	Nails, kegs., 29	118
Machinery, cs., 39	9,965	Hdw., pkgs., 54	995
Ag. imp., pkgs., 1	351	Mf. iron, pkgs., 14	1,000
Wringers.	19	Hdw., pkgs., 23	513
<b>Bremen.</b>		<b>Havre.</b>	
Mf. iron, pkgs., 35	1,600	Ag. imp., cs., 3	307
Hdw., cs., 33	1,473		
Mach'y, cs., 51	2,188	<b>Cuba.</b>	
Pumps, cs., 6	245	Mach'y, pkgs., 30	2,414
Ag. imp., pkgs., 9	700	Nails, kegs., 670	1,906
<b>Rotterdam.</b>		Hdw., pkgs., 54	995
Pumps, pkgs., 13	1,060	Nails, cs., 3	110
Ag. imp., pkgs., 5	220	<b>Porto Rico.</b>	
Hdw., pkgs., 56	2,171	Mach'y, cs., 17	400
Mf. iron, pkgs., 10	488	Steam engine, 1	16,000
<b>Hull.</b>		<b>Hayti.</b>	
Hardware, cs., 27	935	Hdw., cs., 14	310
Ag. imp., pkgs., 2	300	Nails, kegs., 86	294
<b>Liverpool.</b>		Shot, bags, 40	100
Hardware, cs., 34	716	<b>Brazil.</b>	
Mach'y, cs., 7	640	Mach'y, pkgs., 41	1,694
Ag. imp., pkgs., 7	90	Hdw., pkgs., 51	841
Wire, coils, 19	119	Car wheels, 20	500
Spelter, slabs, 669	1,708	<b>Peru.</b>	
Mf. iron, pkgs., 10	450	Hdw., cs., 113	2,899
<b>London.</b>		Ag. imp., pkgs., 201	2,608
Copper, cs., 90	22,500	Mf. iron, pkgs., 22	394
Ag. imp., cs., 23	998	Tinware, bxs., 5	105
Hdw., cs., 141	3,310	Copper, cs., 4	448
Machinery, cs., 1	1,000	Locomotives, 2	21,000
<b>Glasgow.</b>		Cutlery, cs., 17	563
Hdw., cs., 5	175	Nails, kegs., 66	232
Mach'y, cs., 33	3,789	Tacks, cs., 10	440

## IMPORTS

### Of Hardware, Iron, Steel and Metals into the Port of New York, for the week ending November 14, 1876:

Hardware.	Quant. Value.	Steel.	Quant. Value.
Baker Hermann & Co.	Mdse, pkgs., 11	Byrne Joseph & Co.	Tin plates, bxs., 685
Hooper & Townsend,	Cases 1	Curt N. L. & Co.	Tin plates, bxs., 275
Lau & Garlich,	Mdse, pkgs., 4	Dickerson, Van Dusen &	Antimony, cs., 17
Langhland & Co.	Wire, bds., 140	Grey John & Sons,	Tin, cs., 1
Wire, bds., 140		Meyer Moritz,	Wire, bds., 2780
Moore's John P. Sons,	Mdse, pkgs., 3	Merchants' Bank of Can-	ada,
Guns, cs., 6		Tin plates, bxs., 629	
Cartridge cases, cs., 4		Phelps Dodge & Co.	Tin plates, bxs., 320
Cartridge cases, emp-		Order.	
ty, cs., 14		Wire rolls, 1500	
McCoy & Co.	Mdse, pkgs., 6	Arms, cs., 64	
Remington & E. Sons,	Arms, cs., 2	Chains, cs., 85	
Cartridge cases, cs., 9		Anvils, 15	
Schroeder & Daly,	Arms, cs., 2	Without Bill of Lading,	
Arms, cs., 2		Guns, cs., 5	
Spies, Kassam & Co.	Guns, cs., 2	Without Bills of Lading,	
Ward Asline,	Mdse, pkgs., 1	Tin plates, bxs., 1815	
Little, G. & Bros.	Arms, cs., 1	Tin, slabs, 787	
Western Union Tel. Co.	Wire, cs., 50		
Order.			
Wire rolls, 1500			
Arms, cs., 64			
Chains, cs., 85			
Anvils, 15			
Without Bill of Lading,			
Guns, cs., 5			
<b>Iron.</b>			
Henderson Bros.	Pig, tons, 100		
Marvel U. D.	Ore, tons, 290		

**COAL.**—The demand for Coal during the past week has been very small. This has partly been due to the warm weather, which has kept people from putting in Coal, and thus indirectly influenced the trade through the retail dealers. With the exception of Chestnut, Coal has been plenty, and although the stocks are large, they are not remarkably so. Prices are quoted the same as last week, but concessions are apparently easily obtained, and the market shows indications of weakness. Cargoes of Coal thrown upon the market are not taken readily, and only at a reduced price. A slight fall in price seems to be generally expected. The amount of drop cannot, however, be very large, as the margin for profit to the operator is now very small, and should there be a heavy drop suspensions might be expected. It is probable, however, that the changes in price will be but slight. The Pennsylvania Coal Co. will sell 100,000 tons of Coal at auction on Tuesday, the 21st, and the Delaware, Lackawanna and Western Company also sell 10



MEASRA. THOS. WIGHTMAN & CO. have now in successful operation a new glass melting furnace at their works on the South Side, Pittsburgh, which has many advantages over the furnace now in general use, and which promises to exercise a healthy influence in giving an impetus to that branch of Pittsburgh industry. It was invented and patented by Mr. van Jones, and the principal improvement is the construction of the pots, which are much wider and shallower than those now in general use, being made in such proportion that they require but one filling to make a melt, in place of the three fillings of the old plan, saving much time and fuel. The construction of the furnace is such that the blower can make 90 cylinders to the melt, against 60 from the old furnace, and there only being a reduction of the depth of glass in the pot of about 9 inches making 90 cylinders, it is much easier gathered. The furnace is worked without the assistance of a blowing furnace. On the old plan at from five to six melts could be made per week, making, say, 300 cylinders. The new furnace works at the rate of from ten to twelve melts per week, or, say, 1080 cylinders, thus doing three times the amount of work and (on account of the shape of the pots and furnace) with an actual saving of two or three hundred bushels of coal. The shallowness of the pots are much in their favor in resisting the pressure of the melted glass. The furnace has been in operation for a week and is giving perfect satisfaction.





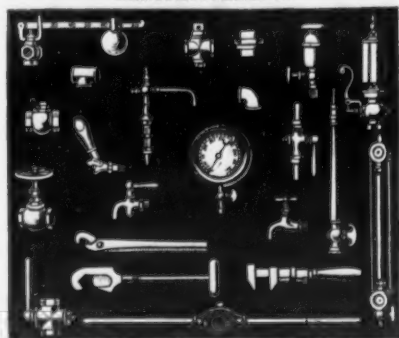


## EATON, COLE & BURNHAM CO.,

58 John Street, New York.

MANUFACTURERS OF

Wrought Iron  
PIPE,  
Cast Iron  
LARGED PIPE,  
Cast Iron  
RADIATORS  
and BOILERS.



Brass & Iron  
STEAM  
Gas & Water  
FITTINGS.  
PLUMBERS'  
MATERIALS.

STEAM GAUGES, TOOLS,  
And all Supplies used by Machinists, &c.

## The American Club Skate Still Ahead.



After the severest tests for the past four years, these skates are now admitted to be the only practical SELF-ADJUSTING SKATES IN MARKET. The clamps are first adjusted to the shoe by turning the thumb-screw D when the lever C is in the above position; when once adjusted, place the skate on the foot, close the lever C, and the skate is securely fastened to the foot. By the action of the clamps, the skate is always in the center of the foot, and cannot slide from side to side as in other clamp skates. They require no heel plates, key or wrench.

PRICE LIST. Per Pair.  
No. 1.—With Blued Footplate, and Runners the same as the best. \$5 00  
No. 2.—Same as No. 1, only nicely Nickel Plated. Effectually prevents the skate from rusting. 6 00  
No. 3.—Same as No. 2, only better the skate is put together each part is finely polished and heavily Nickel Plated, the finest skate ever offered. 8 00

Sole Jobbing Agents for WINSLOW'S WOOD TOP SKATES.

Special trade catalogue sent on application. Address,

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## Bradley's Cushioned Hammer

Has won golden opinions from the Mechanical World during the four years it has been before the public, and has reached a sale of 190 hammers, all in successful operation in this and foreign countries.

It Has More Good Points, Less Complication, More Adaptability,  
Larger Capacity, Does More and Better Work, Takes  
Less Power, Costs less for Repairs

than any other Hammer in the World. GUARANTEED AS REPRESENTED.  
DON'T YOU FORGET IT.

Established 1832.

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John T. Lewis & Bros.,

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PURE WHITE LEAD, RED LEAD,  
Litharge, Orange Mineral,  
Linseed Oil  
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The Atlantic White Lead and Linseed Oil Company,

White Lead (Atlantic), Red Lead,  
Litharge & Linseed Oil.  
ROBERT COLGATE & CO.,  
287 Pearl Street, New York.

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**WETHERILL & BRO.,**  
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## BRASS COCKS AND VALVES

For STEAM, WATER and GAS.

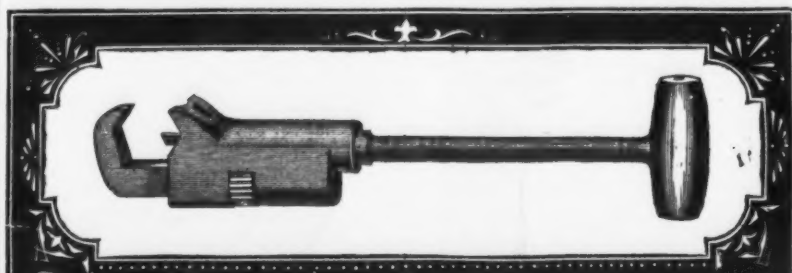
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MADE ENTIRELY OF SOLID CAST STEEL

Cuts Wrought Iron, Brass and Copper Pipes,  
Round Iron &c perfectly true without leaving  
burr on pipe contracting or splitting it. Cuts  
out a chip similar to a lathe tool. The knife  
may be removed and ground. Send for descriptive  
circular to manufacturers.

Pancoast and Maule  
PHILADELPHIA PA.

When you visit the CENTENNIAL, don't fail to examine the

## SELDEN DIRECT ACTING STEAM PUMPS,

No. 3408 PUMP ANNEX,

Especially the

## COMPOUND CONDENSING ONE,

which is guaranteed to do the same work for 50 per cent. less fuel  
than any other Direct Acting Steam Pump now in the market.

A. CARR, Manufacturer, 43 Cortland St., N. Y.

## Pyrolusite Manganese Co.,

MINERS, DEALERS AND EXPORTERS OF HIGH TEST

## Crystallized Black and Gray Oxides of MANGANESE.

Ground, granulated and especially prepared to suit all branches of the home trade.  
Warranted to contain from 70 to 90 per cent. peroxide of manganese, and to give satisfaction with regard to price and quality.

ALSO, MANUFACTURERS OF SUPERFINE FLOATED

## Standard Barytes.

Office, 214 Pearl Street, New York.

## XX Universal Clothes Wringer

POINTS OF SUPERIORITY.

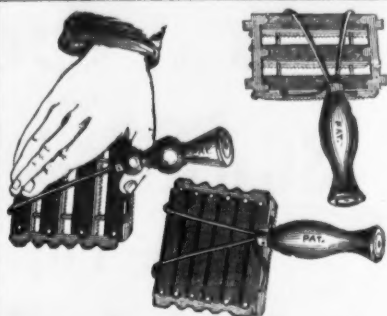


No pains or expense will be spared in continuing to keep this machine as it always has been, the most complete and durable Wringer in the market. The price of this Standard Wringer, of which OVER TWO MILLION have been sold, is now reduced to \$66 per dozen, net. Sold by the trade everywhere.

METROPOLITAN WRINGING MACHINE CO.,

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## The Perfect Comb.

We call your attention specially to our new patent end-less wire frame comb. The result of a long series of experiments, made with a view to meeting all the requirements of a Perfect Comb. It is better, stronger, and more durable than any ever before invented. The raised wire shank gives what has never before been attained, viz: a rest and brace for the thumb, in such a position that the hand cannot come in contact with the horse while using the comb. The wire braces which run from the shank over the back to the front teeth give strength and durability in a direction never heretofore attained, and at the same time serve as an extra handle; and when clasped by the fingers in connection with the raised shank the comb is more firmly, easily, and completely held, and with much less fatigue to the hand than is possible in any other formation—in short, it needs but a trial to vindicate its name: The Perfect Comb.

THE LAWRENCE COMB CO.

Factory and Office,

382 2d Ave., cor. 22d St., N. Y.

WM. S. CARR & CO.

Sole Manufacture

of

CARR'S

PATENT

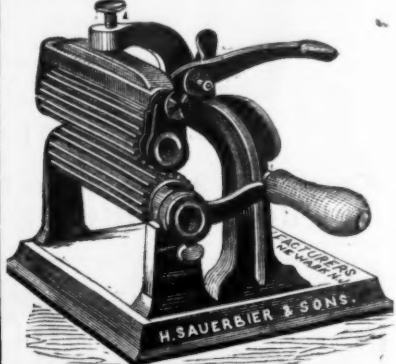
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PUMPS, CABINET WOOD WORK, &c.

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Factory, Mott Haven, NEW YORK.

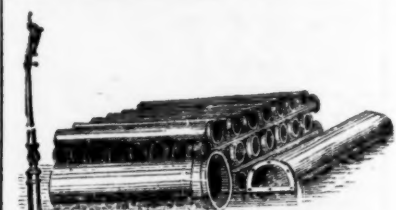


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8 in., \$4 50; 6 in., \$3 00; 4 in., \$2 50.  
Extra Rollers.—8 in., \$2 25; 6 in., \$1 50; 4 in., \$1 25.  
Flutes.—10, 12, 15, 18, 21, 24, 27 & 30, less discount.

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400 CHESTNUT STREET.



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Fig Iron, Lead, Block Tin, and other  
Foundry Metals. Cut Nails.

GEORGE BARNES & CO.,



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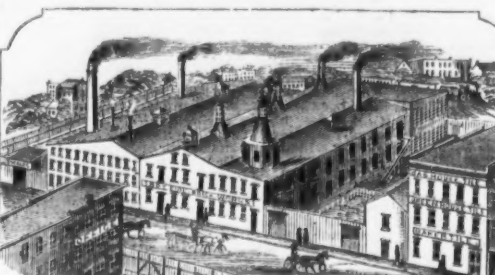
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Wilson John, Sheffield, England.	33
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Fornchorn Chas., Huntington, N. Y.	33
<b>Butts and Hinges.</b>	
American Spring Spring Butt Co., 50 Beekman, N. Y.	40
Remple, Birge & Co., St. Louis, Mo.	35
Union Mfg. Co., 98 Chambers, N. Y.	3
<b>Can Openers.</b>	
Dunlop J. S., Peoria, Ill.	25
<b>Carriage Bolts, Makers of.</b>	
Townsend, Wilson & Hubbard, Phila.	12
<b>Carriage Hangers.</b>	
Smith H. D. & Co., Plantville Ct.	13
<b>Carriage Springs.</b>	
Reed John H., Newark, N. J.	25
<b>Car Wheels, etc., Manufacturers of.</b>	
Taylor Iron Works, High Bridge, N. J.	6
<b>Casters.</b>	
Taylor John, Sons & Co., Newark, N. J.	6
<b>Cast Irons and Cast Iron Hooks.</b>	
Carver John, 283 Pearl, N. Y.	5
<b>Chains, Manufacturers of.</b>	
Buck Bros., Millbury, Mass.	33
The Douglas Mfg. Co., 62 Reade, N. Y.	9
<b>Coal, Makers of.</b>	
Lehigh Valley Coal Co., cor Courtlandt and Church,	7
N. Y.	7
Pardes A. & Co., 24 Reade, N. Y.	7
The Hoboken Coal Co., Jersey City, N. J.	7
<b>Coal Vases.</b>	
Sidney Shepard & Co., Buffalo, N. Y.	7
<b>Coal Hods, Manufacturers of.</b>	
Eastbrook Wm. M., Cherry, Phila.	28
<b>Coal and Milling.</b>	
Lane Brothers, Millbrook, N. Y.	6
Enterprise Mfg. Co., Philadelphia, Pa.	34
<b>Caul Chains.</b>	
Union Chain and Cable Co., Pittsburgh, Pa.	19
<b>Commodities.</b>	
Jewett John P., 25 New Church, N. Y.	12
<b>Compensates and Dividers, Manufacturers of.</b>	
Bemis & Call Hardw. & Tool Co., Springfield, Mass.	12
<b>Compound.</b>	
Hornbostel Chas., 56 Broadway, N. Y.	26
<b>Copper's Tools, etc., Dealers in.</b>	
D. B. Barton Tool Co., Rochester, N. Y.	12
Little Chas. E., 59 Fulton, N. Y.	12
<b>Corrugated Iron.</b>	
Mosley Iron Bridge and Roof Co., 5 Day, N. Y.	5
<b>Cotton Gin Feeders, Manufacturers of.</b>	
The Brown Cotton Gin Co., New London, Conn.	38
<b>Cranes, etc., Manufacturers of.</b>	
Wright & Co., 700 Market, Phila.	35
<b>Curry Combs, Manufacturers of.</b>	
Caswell I. N., Frederick, N. Y.	25
Hotchkiss' Sons, Bridgeport, Conn.	25
Lawrence Curry Comb Co., 38 1/2 Avenue, N. Y.	25
<b>Cutlery, Importers.</b>	
Baker Hermann & Co., 101 Duane, N. Y.	23
Clatworthy F. & W., 82 Chambers, N. Y.	11
Fisher John, 111 Chambers, Phila.	11
Friedmann & Lutterbach, 14 Warren, N. Y.	11
Kline, Birge & Co., 80 Chambers, N. Y.	11
Meriden Cutlery Co., 49 Chambers, N. Y.	11
Owen & Campbell, 50 N. Second, N. Y.	11
Ward Aline, 101 Duane, N. Y.	11
Wilson Hawksworth & Co., 52 John, N. Y.	11
<b>Cutlery, Manufacturers of.</b>	
Burkshaw Aaron, Pepperell, Mass.	11
John Russell Cutlery Co., 91 Chambers, N. Y.	11
Miller Bros. Cutlery Co., W. Meriden, Conn.	11
Nauvau Cutlery Co., 91 Chambers, N. Y.	11
New York Knife Co., Walden, N. Y.	11
The Lanson & Goodnow Mfg. Co., 88 Chambers,	11
N. Y.	11
<b>Door and Gate Springs.</b>	
Quackenbush, Townsend & Co., 50 Reade, N. Y.	24
Van Wagoner & Williams, 82 Beekman, N. Y.	24
<b>Dredging, and Makers of Dredging Machines.</b>	
Am. Dredging Co., 105 Delaware Ave., Phila.	39
<b>Drill Chucks, Manufacturers of.</b>	
Fraser & Co., 61 Chatham, N. Y.	38
Lambertville Drill Works, Lambertville, N. J.	38
<b>Drilling Machines, Makers of.</b>	
Fraser & Co., Philadelphia.	38
Thorne, DeHaven & Co., Philadelphia.	38
<b>Drum Forgings.</b>	
Billings & Spencer Co., Hartford, Conn.	37
Baker Hermann & Co., 101 and 103 Duane, N. Y.	37
Lambertville Drill Works, Lambertville, N. J.	38
Edge Tools, Makers of.	
The D. R. Barton Tool Co., Rochester, N. Y.	12
Wood N. & Gold, N. Y.	13
<b>Electro-Plating.</b>	
Ernhout & Catlin, 48 Gold, N. Y.	27
<b>Elevators, Makers of.</b>	
Crane Bros. Mfg. Co., Chicago, Ill.	9
Holake Machine Co., 279 Cherry, N. Y.	19
Whittier Machine Co., 118 Tremont, Boston, Mass.	38
<b>Emery.</b>	
Geo. H. Gray & Danforth, Boston, Mass.	38
<b>Emery Wheels, Makers of.</b>	
The Union Stone Co., 6 Exchange, Boston.	38
<b>Enamelled Plates.</b>	
Lefferts Enamel Works, 417 W. 24, N. Y.	4
<b>Engineers, Machinists, etc.</b>	
Henshall James, 106 Beach, Phila.	32
Moore James, 106 Beach, Phila.	32
Ohl & Hauschild, 37 to 61 Passaic Ave., E. Newark,	31
<b>Engravers.</b>	
Collins Geo. B., 10 Warren, N. Y.	28
Swinton A., 725 Chester, N. Y.	28
<b>Engraving, Makers of.</b>	
McNab & Hartin Mfg. Co., 56 John, N. Y.	24
<b>Engraving, Self-Measuring, Makers of.</b>	
Interior Mfg. Co., of Pa., Phila. and N. Y.	54
<b>Files, Importers of.</b>	
Car, John, N. Y.	27
Flaser Joseph S., 411 Commerce, Phila.	11
Fraser Peter A. & Co., 16 Fulton, N. Y.	32
Moore J. W., 80 John, N. Y.	32
Sanderson Bros. & Co., 16 Cliff, N. Y.	34
Seear & Jackson, 89 Chambers, N. Y.	33
<b>Files, Manufacturers of.</b>	
Assinonite File Works, Providence, R. I.	18
American File Co., Pawtucket, R. I.	18
Aurum File Works, 50 Chambers, N. Y.	18
Barnett G. & Co., 41 and 43 Richmond, Phila.	18
Diston Henry & Sons, Phila.	29
Draper C. T. & Co., Sing Sing, N. Y.	18
Heller Bros., 118 East 12th, N. Y.	18
Hiscox File Mfg. Co., West Cheshire, Mass.	18
Johnson & Bro., 1 Commercial, Newark, N. J.	18
Jewett Thos. & Sons, Sheffield, N. Y.	18
McCaftroy & Bro., 132 and 134 N. 4th, Phila.	18
Nicholson File Co., Providence, R. I.	18
Paul Chas. B., Williamsburg, N. Y.	18
Rothey John & Wm., Matthews, N. Y.	18
<b>Fire Brick, Makers of.</b>	
Brooklyn Clay Retort and Fire Brick Works, Van	28
Drick, St. Brooklyn, N. Y.	28
Rail A. & Sons, Perth Amboy, N. J.	28
Hall A. & Sons, Buffalo, N. Y.	28
Maunder Henry, 418 East 12th, N. Y.	28
Kremer H. & Son, 58 Goerck, N. Y.	28
Newkumet Philip, 23d and Vine, Phila.	28
Valentine M. D. & Bro., Woodbridge, N. J.	28
Watson John R., Perth Amboy, N. J.	28
Woodland Fire Brick Co., Woodland, Pa.	28
<b>Flat and Emery Paper and Cloth.</b>	
Becker, Adamson & Co., 730 Market, Phila.	34
<b>Fluting Machines.</b>	
Easton's Sons, H. Newark, N. J.	26
<b>Forges, Portable, etc.</b>	
Keystone Portable Forge Co., Philadelphia.	39
<b>Foundries and Machinists.</b>	
Sam J. Greenwell Jr., 812 Race, Phila., Pa.	6
<b>Foundry Factories.</b>	
Uttler & Brown, 288 Cherry, N. Y.	4
Faxson J. & Co., 514 Beach, Phila.	4
Whitehead Bros., 13th, N. Y.	4
<b>Furnaces, Makers of.</b>	
Richmond & Fols, 119 S. Fourth, Phila.	5
<b>Gas Stoves.</b>	
Lefferts Marshall Jr., 90 Beekman, N. Y.	4
<b>Gas Signs.</b>	
Olto Steltz, N. Y. Glass Letter Co., 188 Grand, N. Y.	5
<b>Glass.</b>	
Behr Herman & Co., 251 Pearl, N. Y.	36
<b>Governors.</b>	
Julius Judson & Son, Rochester, N. Y.	38
<b>Grate Bars.</b>	
Vanderbilt Geo., foot W. 13, N. Y.	4
<b>Grate Cradles and Stalls.</b>	
Semple, Birge & Co., St. Louis, Mo.	35
<b>Grindstones.</b>	
Paterson Gilbert, 225 Market, N. Y.	4
Wood Walter R., 283 and 285 Front, N. Y.	38
Worthington & Sons, North Amherst, O.	33
<b>Guns, etc.</b>	
Moore John P. Sons, 300 Broadway, N. Y.	40
Windmiller Louis & Roelker, 30 Reade, N. Y.	40
<b>Gunpowder, Makers of.</b>	
Kneeland F. L. (Dupont) 30 Wall, N. Y.	32
Lafin & Rand Powder Co., 21 Park Row, N. Y.	32
<b>Hammer, etc., Manufacturers of.</b>	
Rammond H., Hartford, Ct.	36
<b>Handles, Makers of.</b>	
Temple, Birge & Co., St. Louis, Mo.	35
<b>Hardware Dealers.</b>	
Barker W. C. & Co., Chicago.	12
Betts & Barker, 50 Chambers, N. Y.	12
Brower John I. & Son, 288 Grand, N. Y.	12
Lloyd, Spitzer & Walton, 625 Market, Phila.	38
Quackenbush, Townsend & Co., 50 Reade, N. Y.	34
<b>Hardware Importers.</b>	
Baker Hermann & Co., 101 Duane, N. Y.	33
King, Birge & Co., 80 Chambers, N. Y.	33
Van Wart & McCoy, 134 and 136 Duane, N. Y.	11
Harold F. W., 28 Chambers, N. Y.	11
Windmiller Louis & Roelker, 30 Reade, N. Y.	40
<b>Hardware Manufacturers.</b>	
American Spring Spring Butt Co., 50 Beekman, N. Y.	40
Blake Bros. Hardware Co., New Haven, Conn.	40
Sawett Oscar, Newark, N. J.	40
Riglin Philip S., 90 Reade, N. Y.	40
Corbin F. & Co., 87 Chambers, N. Y.	40
Katherine Mfg. Co., Phila.	40
Hart, Birven & Mead Mfg. Co., 248 Pearl, N. Y.	40
Miller & Fells Mfg. Co., 74 Chambers, N. Y.	40
Pearl & Gaff Mfg. Co., Cincinnati, O.	40
Perin & Gaff Mfg. Co., Cincinnati, O.	40
Remple, Birge & Co., St. Louis, Mo.	40
Seaward Sidney & Co., Buffalo, N. Y.	40
Spencer & Underhill, 34 Beekman, N. Y.	40
<b>Hinges.</b>	
Lewis Oliver & Phillips, Pittsburgh, Pa.	13
<b>Hoes.</b>	
Hicks O. H. & Co., Baltimore, Md.	38
<b>Hoeing Engines, Makers of.</b>	
Crane Bros. Mfg. Co., Chicago, Ill.	9
Otto Bros. & Co., 24 Broadway, N. Y.	9
<b>Horse Nails, Makers of.</b>	
Annable Horse Nail Co., 35 Chambers, N. Y.	19
Northwestern Horse Nail Co., Chicago, Ill.	36
Booke Nail Co., Boston, Mass.	31
Platt & Co., Buffalo, N. Y.	31
Putnam S. S. & Co., Neponset, Mass.	6
The Torrington Nail Co., Torrington, Conn.	6
<b>Horse Shoes, Makers of.</b>	
Boston Rolling Mills, 17 Battery March, Boston.	4
Hardy Iron Works, Troy, N. Y.	4
Rhode Island Horse Shoe Co., Providence, R. I.	4
Schoenberger & Co., Pittsburgh, Pa.	4
<b>Hydraulic Jacks.</b>	
Indusene Richard, 34 Columbia, N. Y.	36
Lyons E., 40 Grand, N. Y.	19
<b>Ice Chills.</b>	
Holden E. J. & Co., 34 Beekman, N. Y.	4
<b>Insurance, Boiler.</b>	
Hartford Steam Boiler Inspection and Insurance Co.	39
<b>Iron Brokers.</b>	
Boynton Geo. A., 70 Wall, N. Y.	4
Crane U. O., 104 John, N. Y.	4
Hart A. G., Pittsburgh, Pa.	4
Hazard T. D., 24 Pearl, N. Y.	4
Smith, Minor, 25 Beaver, N. Y.	4
<b>Iron Bridges.</b>	
Leighton Bridge and Iron Works, Rochester, N. Y.	16
<b>Iron (Castings).</b>	
Spencer's Sons, L. S. Guilford, Conn.	2
<b>Iron Charcoal, Warm or Cold Blast.</b>	
Quincy John W. & Wm., N. Y.	2
<b>Iron Combined Merchants.</b>	
Brown T. Horace, 30 1/2 Wall, Phila.	5
Hand Jas. C. & Co., 61 and 63 Market, Phila.	5
Spencer & Collins, St. Louis, Mo.	5
<b>Iron, Pig, Importers of.</b>	
Low S. B., Chattanooga, Tenn.	5
Williamson James & Co., 9 Wall, N. Y.	5
<b>Iron Dealers.</b>	
Abel Brothers, 130 South, N. Y.	4
Bonell, Rotterdam & Co., N. Y.	4
Borden & Lovell, 70 and 71 West, N. Y.	4
Brady Matthew, 4 Bridge, Brooklyn, N. Y.	4
Cleveland Iron Works, Cleveland, O.	4
Couney Daniel F., 90 Wall, N. Y.	4
Buerstel G., 90 Market St., N. Y.	4
Fuller, Lord & Co., 120 Grand, N. Y.	4
Jackson & Chase, 535 and 542 Frankl., N. Y.	4
Judson B., 45 and 459 Wall, N. Y.	4
Quinn Wallace, 53 Broadway and 91 Elm, N. Y.	4
Lowland Wm. & Harvey, Phila.	4
Pierson & Co., 51 Broadway, N. Y.	4
Quincy John, 85 Wall, N. Y.	4
Reed John H. & Co., 40 Mangan St., N. Y.	4
Richard D. W. & Co., 40 Mangan St., N. Y.	4
Snyder Asa, Richmond, Va.	4
Streets, N. Y.	4
Warner A. B. & Co., 37 Wall, N. Y.	4
Williamson James & Co., 9 Wall, N. Y.	4
Whitney A. B. & Co., 50 Hudson, N. Y.	4
<b>Iron, Manufacturers of.</b>	
Boston Rolling Mills, 17 Battery March, Boston.	4



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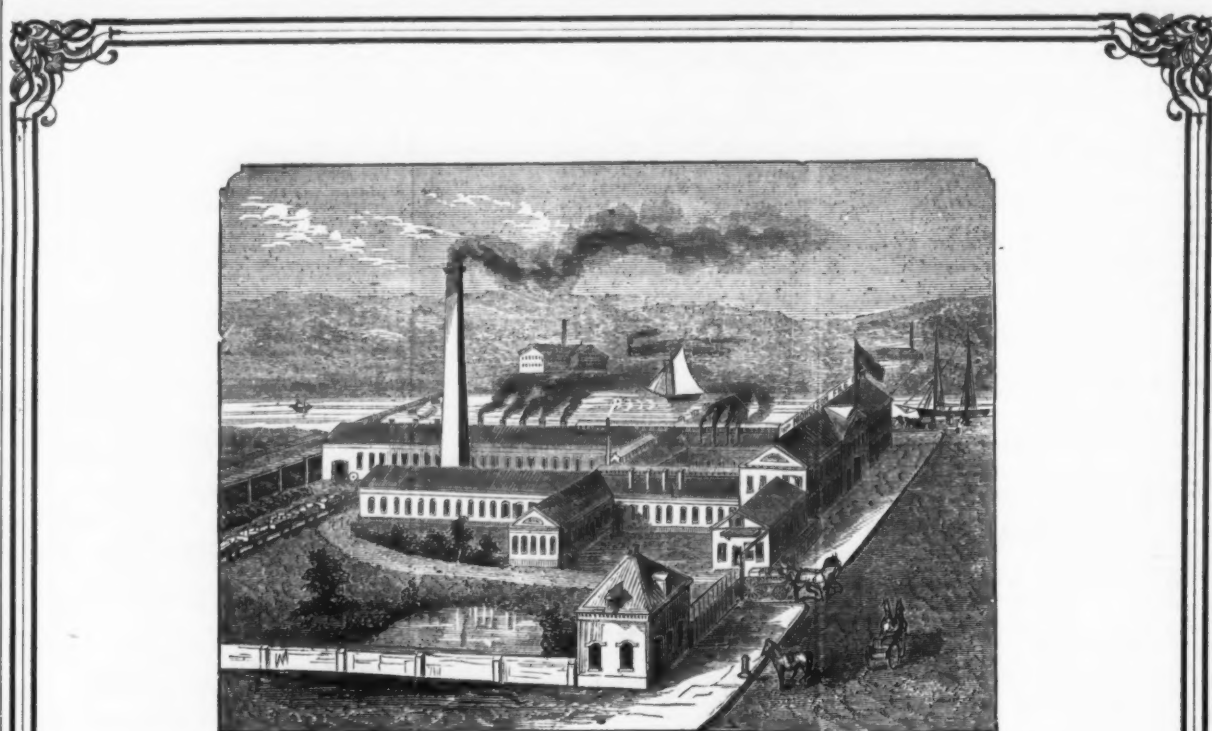


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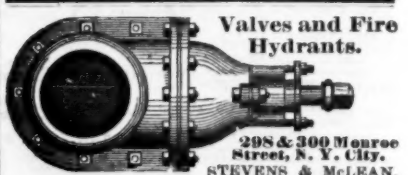
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# CENTENNIAL AWARDS

TO

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A Medal, and a Diploma signed by the President, Director General and Secretary of the United States Centennial Commission, has been awarded to Henry Disston & Sons, Philadelphia, Pa., on the following report of the Judges of Group I, consisting of

ALEXANDER L. HOLLEY, 56 Broadway, New York.

Prof. T. STERRY HUNT, LL.D., F.R.S., St. James Hotel, Boston, Mass.

Prof. J. M. SAFFORD, Tennessee.

S. B. AXTELL, Santa Fe, New Mexico.

JOHN FRITZ, Bethlehem, Pa.

AUSTIN SAVAGE, Boise City, Idaho.

W. S. KEYES, M. E., Eureka, Nevada.

Prof. FREDERICK PRIME, Jr., Sec'y., Easton, Pa.

MATTHEW ADDY, Cincinnati, Ohio.

Prof. G. C. BROADHEAD, Pleasant Hill, Missouri.

Mr. ISAAC LOWTHIAN BELL, F.R.S., M.P., C.E., Pres't., Great Britain.

Mr. ERNST F. ALTHANS, Germany.

Mr. L. SIMONIN, France.

Mr. F. VALTON, France.

RICHARD AKERMAN, Sweden.

Mr. OCHILLE JOTTRAND, Belgium.

Mr. L. NICHOLSKY, Russia.

Mr. NICHOLAS JOSSA, Russia.

Prof. Dr. TH. KJERUNF, Norway.

DON DAN'L DE CORTAZAR, Spain.

EMANUEL BARCENA, Mexico.

### REPORT:

## CAST STEEL INGOTS, BLOOMS AND PLATES,

**Commended for Good Quality.**

A Medal, and a Diploma signed by the President, Director General and Secretary of the United States Centennial Commission, has been awarded to Henry Disston & Sons, Philadelphia, Pa., on the following Report of the Judges of Group XV, consisting of

CHAS. STAPLES, Portland, Me.

DANIEL STEINMETZ, Pres't., Philadelphia Pa.

GEORGE L. REED, Clearfield, Pa.

General JOHN D. IMBODEN, Richmond, Va.

Hon. J. BAIN, Lord Provost of Glasgow, Great Britain.

Mr. D. MACHARDY, Great Britain.

Mr. DIEFENBACH, Sec'y., Germany.

### REPORT:

## SAWS, Trowels, Plumbs and Levels, Squares and Bevels, Reversible Butt Hinges and Screw Drivers,

**Commended as a very large display of Surpassing Excellence of Material, Style and Finish.**

A Medal and a Diploma, signed by the President, Director General and Secretary of the United States Centennial Commission, has been awarded to Henry Disston & Sons, Philadelphia, Pa., on the following Report of the Judges of Group XXI, consisting of

GEORGE H. BLELOCK, Springfield, Mass.

W. F. DURFEE, Wisconsin, (at 56 Broadway, N. Y.)

Prof. JOHN A. ANDERSON, President Kansas State Agricultural College, Manhattan, Kansas.

Mr. JOHN ANDERSON, LL.D., C.E., Pres't., Great Britain.

M. LE COMMANDANT F. PERIER, France.

Mr. C. A. ANGSTROM, Sweden.

Mr. AUGUSTE COBERT, fils, Sec'y., Belgium.

Mr. FELIX REIFER, Austria.

### REPORT:

## CIRCULAR AND OTHER SAWS,

**Commended for Good Workmanship, for the Practical Tools for keeping Saws in good order, and for the Beauty of their General Display.**



**New York Wholesale Prices, November 15, 1876.**

## HARDWARE.

[illegible][illegible]

Danbury	each \$8.00	dis 30
Horse Back Patent	each \$10.00	dis 30
<b>Egg Beaters.</b>		
Monroe's	5 in. 10 in.	dis 19
	Per doz \$20 00	do \$20 00
National	do	do \$20 00
Genuine Chester—Regular Nos.	do	do 60
Washington Mills—Flour and F.F.	do	do 80
"Flour.	do	do 80
Wellington Mills, Grain.	do	do 80
<b>Enameled and Tinned Ware.</b>		
Kettles	do	do 50
Sauce Pans	do	do 50
Tinned Saucepans	do	do 50
<b>Eccentricity.</b>		
Door Lock	same discounts as Door Locks	dis 60
Wood	do	do 60
<b>Faucets.</b>		
Fenn's	do	do 50
Star	do	do 50
Star's Patent Petroleum	do	do 50
Wood, Cork Lined	do	do 50
Enterprise Mfg. Co., Self-Measuring	do	do 50
<b>Felted Plates.</b>		
American File Co.	\$5 00 to 1 currency—	dis 40
Arcade File Works	\$5 00 to 1 currency—	dis 40
Auburn File Works	\$5 00 to 1 currency—	dis 40
Heller & Bros	\$5 00 to 1 currency—	dis 40
Johnston File Co.	\$5 00 to 1 currency—	dis 40
Madden & Cuckayne File Co.	\$5 00 to 1 currency—	dis 40
Stubs' Horse Raps	5 00 to 10 00	do 40
Water Spencer & Co.'s "Diamond"	4 50 to 10 00	do 40
Walter & Jackson's	5 25 to 10 00	do 40
H. I. Botsford	5 00 to 10 00	do 40
Moore's	4 75 to 10 00	do 40
Thos. Turner & Co. (Peter A. Frasse & Co.)	5 00 to 10 00	do 40
"Philo Shilling" P. T. Co.	5 00 to 10 00	do 40
Linet & Co. (French)	4 75 to 10 00	do 40
<b>Fluting Machines.</b>		
Mrs. C. P. Poy	5 in. \$6 00; 5 in. \$3 00; 6 in. \$4 00	dis 25
Mrs. C. P. Poy No. 178	each \$2 50	dis 25
Kureka, 4 inch Rolls	5 00 each	dis 10
Peelers, 4 inch Rolls	5 00 each	dis 10
Improved Kurek (Ultimax), 4 inch	4 75 each	dis 10
Champion, 6 inch rolls	4 00 each	dis 10
Empire	4 00 each	dis 10
Kureka No. 1, 4 inch Roll	6 75 each	dis 10
Defiance	4 in. \$5 50; 4 in. \$4 00; 5 in. \$5 00	dis 10
K. P. M., 4 1/2 inch Roll	5 00 each	dis 10
Crown, 4 1/2 in. Roll, \$5 75; 6 in. \$4 00; 8 in. \$5 00	dis 10	
Domestic Fluter	\$1 00 each	dis 10
<b>Fluting Scissors.</b>		
Force	do	dis 40
Keystone Portable Forge Co.	do	dis 40
<b>Forks.</b>		
Grout and Spading	do	dis 35
Flanged A 1	do	dis 40
Reed & Barton	do	dis 40
Kerns Mfg. Co.	do	dis 40
<b>Fry Pans.</b>		
Burton & Co. & W., new list.	do	dis 55
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**Drugs.**  
Gale, Western..... \$ per doz \$2.50—dis 60  
" N. Y. State..... \$ doz 7.00—dis 60  
Rolled Plate..... \$ doz 7.00—dis 60  
Wrought Strap and..... \$ doz 7.00—dis 60  
Providence Plate..... \$ doz 7.00—dis 60  
Screw Hook and Strap..... \$ doz 7.00—dis 60  
Heavy Welded Hook..... \$ doz 7.00—dis 60  
Screw Hook and Eye..... \$ doz 7.00—dis 60

**Horns.**  
Sole, Frank, C. S. Crown..... \$ doz 3.00—dis 60  
Socket..... \$ doz 3.00—dis 60  
Riveted Eye..... \$ doz 3.00—dis 60  
Planter..... \$ doz 3.00—dis 60  
Screw Pattern..... \$ doz 3.00—dis 60  
Lane C. S. Crown..... \$ doz 3.00—dis 60  
Winsted Patterns' Pattern..... \$ doz 3.00—dis 60

**Hooks.**  
Bird Cage..... \$ doz 3.00—dis 60  
Belt..... \$ doz 3.00—dis 60  
Bench-Hitching..... \$ doz 3.00—dis 60  
McGill's..... \$ doz 3.00—dis 60  
Clothes Line, Hard..... \$ doz 3.00—dis 60  
Reading list..... \$ doz 3.00—dis 60  
Wrought stapes and Hooks and Staps..... \$ doz 3.00—dis 60  
Wire Screw Hooks and Eyes..... \$ doz 3.00—dis 60  
Whiffletree Patent..... \$ doz 3.00—dis 60  
Hooks and Eyes-Malleable Iron..... \$ doz 3.00—dis 60

**Horse Nails.**  
Ausable..... \$ doz 3.00—dis 60  
" " Blued..... \$ doz 3.00—dis 60  
Cortland..... \$ doz 3.00—dis 60  
Harris..... \$ doz 3.00—dis 60  
Globe, P. & Pold..... \$ doz 3.00—dis 60  
National, Pointed and..... \$ doz 3.00—dis 60  
Polished Eye, Pin..... \$ doz 3.00—dis 60  
Perkins' Pointed and..... \$ doz 3.00—dis 60  
Polished..... \$ doz 3.00—dis 60  
Blued..... \$ doz 3.00—dis 60  
Putnam Hammer P. & D..... \$ doz 3.00—dis 60  
Harris' Sliding Head Pin..... \$ doz 3.00—dis 60  
Strand, Inc., Morgan..... \$ doz 3.00—dis 60  
Berkins and Vulcan..... \$ doz 3.00—dis 60  
Perkins' Vulcan and Globe..... \$ doz 3.00—dis 60

**Ice Axes, Chisels, Etc.**  
National..... \$ doz 3.00—dis 60  
Novelty Ice Breakers..... \$ doz 3.00—dis 60  
Dunlap's Ring Flakes..... \$ doz 3.00—dis 60  
Wood Head Flakes, Sargent's..... \$ doz 3.00—dis 60  
Ice Mallets, Pick in Head..... \$ doz 3.00—dis 60  
Ice Axes, Small, Cast or Malleable..... \$ doz 3.00—dis 60

**Knobs.**  
Ames Butcher Knives..... \$ doz 3.00—dis 60  
" Bread..... \$ doz 3.00—dis 60  
Hay and Straw, Wadsworth's..... \$ doz 3.00—dis 60  
Carriage (Jap'd 50 cents per gross)..... \$ doz 3.00—dis 60  
" Plush Tip..... \$ doz 3.00—dis 60  
" Elastic End, No. 8..... \$ doz 3.00—dis 60  
" Por. Jap'd..... \$ doz 3.00—dis 60  
" Plated..... \$ doz 3.00—dis 60  
Furniture, Plain..... \$ doz 3.00—dis 60  
" Wood Screws..... \$ doz 3.00—dis 60

**Ladders.**  
Melling, Hart's..... \$ doz 3.00—dis 60  
" Sargent's..... \$ doz 3.00—dis 60  
" Monro's Patent..... \$ doz 3.00—dis 60

**Lanterns.**  
No. 6, \$11.00; No. 1, \$4.00..... \$ doz 3.00—dis 60  
With Gaudy, 50c. extra..... \$ doz 3.00—dis 60  
No. 5, per doz \$11.75—dis 60  
" No. 4, per doz \$11.75—dis 60  
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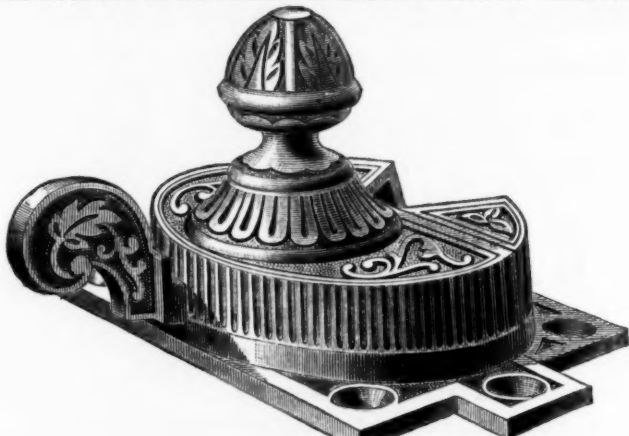
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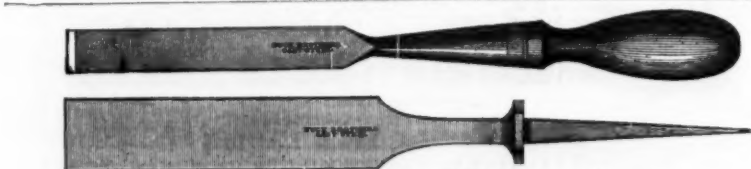
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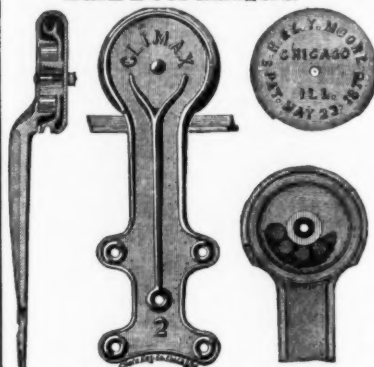
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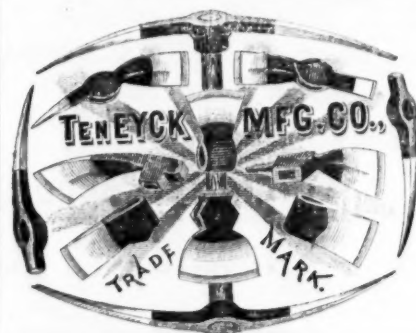


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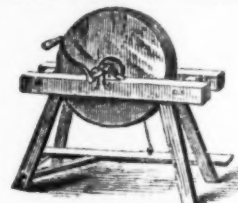


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(American)  
FILES and HORSE RASPS.  
"WIDE AWAKE"  
AXES.

## BLAKE BROTHERS

### HARDWARE CO.,

New Haven, Conn.

ESTABLISHED 1830.

Manufacturers of

**BUILDERS' HARDWARE, BUTTS, HOUSE  
TRIMMINGS, CARRIAGE,  
And GENERAL HARDWARE**

The attention of our old Customers and the Trade generally is invited to our new Illustrated Catalogue just issued, comprising a full assortment of our well known staple goods: Butts (Drilled and Wire jointed), Thumb Latches, Sash, Upright Screw and Side Pulleys, Wardrobe and Harness Hooks, Draw Pulls, Nut Crackers, Cork Screws, &c., &c. Also several new and attractive styles of Fancy Hardware, at prices to suit the times.

Our new Patent Fancy Open Work Cap Butt, with Ornamented Knuckle, in Real and Imitation Bronze, and our Nickel Plated Cap Butts, with concealed Screws, are the handsomest in the market, and are attracting much attention. While making plain and japanned goods a specialty, we are prepared to meet the increasing demand for ornamented bronze and nickel plated House Trimmings. Goods packed in boxes or bundles, as may be preferred. For catalogue and price list address

## BLAKE BROTHERS HARDWARE CO.,

New Haven, Conn.

### IRON BLOCK PLANE.

No. 110. 7 1-2 inches Long, 1 3-4 inch Cutter, \$9.00 per dozen.



STANLEY RULE AND LEVEL COMPANY, Manufacturers,  
Factories, New Britain, Conn., Waterbury, 35 Chambers St., N. Y.

## COBB & DREW,

Plymouth, Mass.

Manufacturers of Copper, Brass, and Iron Rivets: Common and Swedge Iron, Leathered, Carpet, Lace and Gimp Tacks: Finishing, Hungarian, Trunk, Clout and Cist Box Nails, &c. Rivets made to order.

NEW YORK AGENCY

## Grundy & Kenworthy

### HARDWARE.

165 Greenwich Street.

Agent for the Philadelphia Star Carriage and Tire Bolts

Established in 1836.

## Shelton Company,

Manufacturers of every variety of

**TACKS & SMALL NAILS,**  
Carriage, Machine, Plow, Stove and  
Tire Bolts, Coach Screws,  
Bed Screws, &c.  
BIRMINGHAM, CONN.

A. G. COES  
PAT. DEC. 26, 1871

Established in 1839.

## A. G. COES & CO.

WORCESTER,

Mass.,

Manufacturers of

THE GENUINE

COES'

## SCREW WRENCHES.

Our goods have been very much improved recently, by making the Bar WIDE, as shown in the cut, which makes a 12 in. Wrench as strong as a 15 in. made in the ordinary way, and by using

A. G. COES'  
NEW PATENT

## FERRULE

Which cannot be forced back into the handle.

Our goods are manufactured under Patents dated February 7, 1860, (re-issued June 29, 1871), May 2, 1871, and Dec. 26, 1871, and any violation of either will be vigorously prosecuted.

We call particular attention to our new Patent Ferrule, with its Supporting Nut (shown in section in the above cut), which makes the strongest Ferrule fastening known.

A. G. COES & CO.



MODEL

## Scroll Saws,

(Best in the Market.)

## Flower Pot Brackets,

Self-Acting Fountains,

## AQ ARIA, FILES, VISES,

And Specialties in

HOUSE FURNISHING GOODS.

Send for price lists.

## G. WEBSTER PECK,

Manufacturers' Agent,  
110 Chambers Street, N. Y.

TO THE

## HARDWARE TRADE.

A General Assortment of

## HARDWARE

For the Country Trade Constantly  
on hand.

John I. Brower & Son,  
288 Greenwich St., NEW YORK.

## The Hart, Bliven & Mead Mfg. Co.,

18 & 20 Cliff Street, and 243 & 245 Pearl Street, New York.

Factories at KENSINGTON, CONN.

MANUFACTURERS OF

## BUILDERS' HARDWARE.



## HAT AND COAT HOOKS.

Wardrobe, Ceiling, Clothes Line and Harness Hooks, Brass Screw and Drive Hooks, every kind and style.

Our Catalogue and "1876 Centennial Appendix" is now ready for distribution to patrons. A full set of samples and Post Office Box in the Main Building (P. 7) Centennial International Exhibition, Philadelphia, Pa.

## Lloyd, Supplee & Walton,

### HARDWARE FACTORS.

MANUFACTURERS OF

## Bonney's Hollow

### AUGERS.

Stearn's Hollow Augers

and Saw Vises

Bonney's Spoke Trimmers

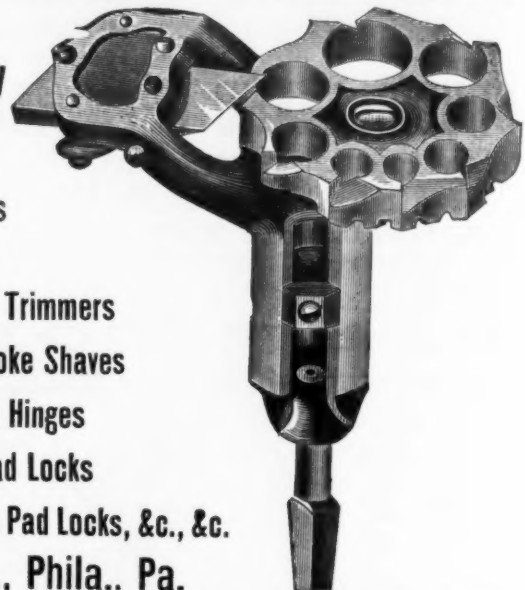
Double Edge Spoke Shaves

Adjustable Gate Hinges

Scandinavian Pad Locks

Flat Key Brass and Iron Pad Locks, &c., &c.

625 Market St., Phila., Pa.



## W. B. BELKNAP & CO.,

Agents for

"Crescent" Tool and Machinery Steels.

"Eagle" Anvils and Vises.

Standard Nut Co.'s Nuts and Washers.

Hussey, Binns & Co.'s

Solid Steel Shovels, Spades and Scoops.

## BURDEN'S BOILER RIVETS.

A complete stock of

Horse Shoes, Chains, Bolts, Rivets and Heavy Hardware

Nos. 113 and 115 West Main Street,

LOUISVILLE, KY.

## PHILIP S. BIGLIN,

Successor to W. F. SHATTUCK & CO.,

Manufacturers' Agent for

## AMERICAN HARDWARE.

95 Reade & 113 Chambers Sts., New York,

Shattuck's Union and Counter Scales,  
Phelan's Axes, Hatchets, Picks, &c.  
Wellman's Gimlet, Clinch Bit, &c.  
Griswold's Augers, Auger Bits, &c.  
Hilroyd & Co.'s Stocks and Dies.  
Yaw's "Genuine" Wrought Cow Bells.  
Baron's Hand and Sled Bells.

Maltby's Britannia and Cocon Dippers,  
Eddy's Refined Lamp Black.  
"Eagle" Axe, Pick and other Handles.  
"Eureka" Flint, Sand and Emery Papers.  
Corliss Forged Horse Nails.  
Tackle Blocks, Spokes, &c., &c.



## GREENFIELD TOOL CO.,

Greenfield, Mass.

Sole Manufacturers of the Celebrated

## "Diamond" PLANE IRONS

EXTRA PLATED TABLE CUTLERY. PATENT FORGED OX SHOES. The only Shoe made with concavity to fit hoof. BENCH AND MOULDING PLANES of every description, &c., &c. Drop Forgings to order. Address for Catalogue with stamp.

## WILSON MANUFACTURING COMPANY.,

NEW LONDON, CONN.

MANUFACTURERS OF

## SOLID BOX VISES.

With or without Convex and Concave Washers.

Jackscrews, Braces, Coffee Mills, Turning Lathes, Clamp Heads and Screws; Parallel Bench Vises, Sash Pulleys, Ho House Pulleys, Composition Cocks, Bench Screws, Vise Screws, Gridirons, Drill Stocks and Bows, Box Chisels, Rivets, Sheaves, Block Pins, Composition Roller and Iron Bushings, Riggers' Screws, Caulkers' Tools, Pump Chambers, Belaying Pins, Marlin Spikes, Malleable Iron Castings, and General Hardware.

GALVANIZING DONE TO ORDER.

WILSON MFG. COMPANY,

Warehouse, 97 Chambers and 81 Reade Streets, N. Y.





## PHILADELPHIA.

(Corrected weekly by Lloyd, Silliman &amp; Watson).

Terms, 30 days. For 60 or 90 days, interest added at 10 per cent. per annum.

**Anvils.**—Solid Cast Steel.....\$146  
Peter Wright's, 11 1/2 gold.....11 1/2  
Wilmington.....11 1/2  
Eagle.....11 1/2  
Apple Parers.—Domestic.....per doz \$6.50  
Peach Parers.....10.50  
Bay State Parer, Corer and Slicer.....12.50  
Other makes.....7.50  
Lots of 5 to 25 dozen special price.

**Bars.**—(according to weight).—Per doz \$10.50 @ 9.50  
Red Indian.....10.50 @ 10.00  
Red Chertlain.....11.00 @ 10.50  
Crown Prince.....11.00 @ 10.50  
Hunt's.....12.50 @ 11.50

**Augers and Auger Bits.**—  
Benjamin Pierce.....dis 35  
Douglas & Sons.....dis 40 @ 10.50  
Connecticut Valley Auger Bit.....dis 40 @ 10.50  
Cook's Bit.....dis 40 @ 10.50  
Jennings' Bit.....dis 40 @ 10.50  
Bates' Nut Auger.....dis 40 @ 10.50  
Douglas & Sons' Augers.....dis 40 @ 10.50  
Watrous Ship Augers.....dis 40 @ 10.50  
Romer's Pat. Hollow Augers.....dis 40 @ 10.50  
Stearns' Patent Hollow Augers.....dis 40 @ 10.50

**Balances.**—  
Light or Common.....dis 25 @ 10  
All other Spring Balances.....dis 25 @ 10

**Bells.**—Bever Bros. Mfg. Co. Light Hand  
Bells.....dis 70 @ 10  
Common (Flange Paper Weight).....dis 70 @ 10  
Bever Pattern Hand Bell.....dis 70 @ 10  
Connell's Door Bell.....dis 70 @ 10  
Gt. Western & Kentucky Cow.....dis 70 @ 10

**Boring Machines.**—Bates Mfg. Co., com-  
plete with augers.....dis 30 @ 25  
Douglas Mfg. Co., complete with augers.....dis 30 @ 25  
Common boring Machines, no Augers.....dis 30 @ 25  
Anequa.....dis 30 @ 25

**Bolts.**—Eastern Carriage Bolts.....dis 75 @ 10  
Western.....dis 75 @ 10  
Philadelphia.....dis 75 @ 10  
Wrought Nutter, Stanley.....dis 80 @ 10 @ 10.50

**Braces.**—Barber's.....dis 40 @ 5  
Backus.....dis 40 @ 5  
Bartholomew's.....dis 40 @ 5  
Spitzard.....dis 40 @ 5

**Bulls.**—Cast Fast Joint, Narrow.....dis 25 @ 10 @ 10.50  
Broad.....dis 25 @ 10 @ 10.50  
Cast Fast Loose Joint.....dis 25 @ 10 @ 10.50  
Acorn Loose Pin.....dis 25 @ 10 @ 10.50  
Mayers & Parliament.....dis 25 @ 10 @ 10.50  
Acorn Jap'd.....dis 25 @ 10 @ 10.50  
Wrought Loose Pin.....dis 25 @ 10 @ 10.50  
Table Hinges and Back Flaps.....dis 25 @ 10 @ 10.50  
Narrow.....dis 25 @ 10 @ 10.50  
Loose Joint.....dis 25 @ 10 @ 10.50  
Parker's Blind Butts.....dis 25 @ 10 @ 10.50  
Buffalo Hoo.....dis 25 @ 10 @ 10.50  
Discount 5% to 10% by the  
Shepard.....case 25

**Butt.**—Lail & Porter's (Phila.) Hinges.....dis 65 @ 5, case, 60 @ 5  
Garrett's No. 0 Hinges.....dis 70 @ 10  
Cherrytree No. 0.....dis 70 @ 10  
Chambers—German Hatter and Coll.....dis 30 @ 25  
Bastard.....dis 30 @ 25  
Best Proof Coll. Chain.....dis 30 @ 25  
By the case, 500 lbs., 1/2 c per lb. less Common  
Chain, 1/2 c per lb. less.

**Chisels.**—Socket Framing.....dis 60 @ 10 @ 10.50  
Socket Framing.....dis 60 @ 10 @ 10.50  
Taper.....dis 60 @ 10 @ 10.50  
Beats & Framing and Firmer.....dis 20 @ 5

**Casters.**—Iron rod.....dis 40 @ 10  
Porcelain Wheel Bed.....dis 40 @ 10  
Iron and Brass Wheel Plate.....dis 40 @ 10  
Porcelain Wheel.....dis 40 @ 10

**Clothes Wringers.**—Universal.....per doz \$72 @ 60  
Rover.....dis 70 @ 10  
Monitor.....dis 70 @ 10  
Discount on 2 dozen lots, \$1 per dozen

**Coffee Mills.**—Common box and Side.....dis 20 @ 5  
Patent Box and Side.....dis 20 @ 5  
Coffey—American Pocket (best).....dis 30 @ 25  
Landers, Fry & Clark, J. Russell & Co., and Lamson  
& Goodnow Mfg. Co., Manufacturers' net prices.

**Drawing Knives.**—Hart Mfg. Co., s.....dis 60 @ 5  
Adjustable Handle.....dis 10 @ 15  
Beatty.....dis 10 @ 15

**Dry Pans.**—  
Tinned.....dis 60 @ 45  
No. 0.....dis 60 @ 45  
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**Files.**—  
Nicholson Mill File.....dis 10 @ 10  
Bastard.....dis 10 @ 10  
Taper.....dis 10 @ 10  
Butcher's Mill.....dis 10 @ 10  
Bastard.....dis 10 @ 10  
Taper.....dis 10 @ 10

**Fluting Machines.**—  
Mrs. Knox—4 1/2 in. rolls.....each \$30 @ 25  
—4 in. rolls.....each \$25 @ 20  
—3 1/2 in. rolls.....each \$20 @ 15  
Imperial—4 1/2 in. roll.....each \$25 @ 20  
—4 in. roll.....each \$20 @ 15  
Crown—4 1/2 in. roll.....each \$25 @ 20  
—4 in. roll.....each \$20 @ 15

**Hammers.**—  
Cresce & Plumb.....dis 15 @ 10  
Hammond & Son's.....dis 15 @ 10  
Verree.....dis 15 @ 10

**Hatchets.**—  
Shingling and Half.....dis 25 @ 10  
Verkes & Plumb.....dis 25 @ 10  
Shingling and Half.....dis 25 @ 10  
Claw.....dis 25 @ 10

**Hinges.**—  
Door Mortise and Rim, Min. (New list; Discount 35 @ 35 @ 5)

**Horse Nails.**—  
Ausable.....dis 25 @ 10  
Globe.....dis 25 @ 10  
Brundage.....dis 25 @ 10  
Putnam.....dis 25 @ 10  
On Ausable Globe and Brundage 1000 lbs. lots.....dis 5 @ 5

**Knobs.**—  
Door Mortise and Rim, Min. (New list; Discount 35 @ 35 @ 5)

**Locks and Latches.**—  
Door Locks, Rim and Mortise.....dis 35 @ 25 @ 30  
Till and Cupboard.....dis 35 @ 25 @ 30  
American Padlocks.....dis 35 @ 25 @ 30  
Scandinavian Padlocks.....dis 35 @ 25 @ 30  
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**Knives.**—  
Butcher's Mill.....dis 10 @ 10  
Bastard.....dis 10 @ 10  
Taper.....dis 10 @ 10

**Knobs.**—  
Door Mortise and Rim, Min. (New list; Discount 35 @ 35 @ 5)

**Locks and Latches.**—  
Door Locks, Rim and Mortise.....dis 35 @ 25 @ 30  
Till and Cupboard.....dis 35 @ 25 @ 30  
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**Knives.**—  
Butcher's Mill.....dis 10 @ 10  
Bastard.....dis 10 @ 10  
Taper.....dis 10 @ 10

**Knobs.**—  
Door Mortise and Rim, Min. (New list; Discount 35 @ 35 @ 5)

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No. 100.....dis 35 @ 25 @ 30

**Knives.**—  
Butcher's Mill.....dis 10 @ 10  
Bastard.....dis 10 @ 10  
Taper.....dis 10 @ 10

**Knobs.**—  
Door Mortise and Rim, Min. (New list; Discount 35 @ 35 @ 5)

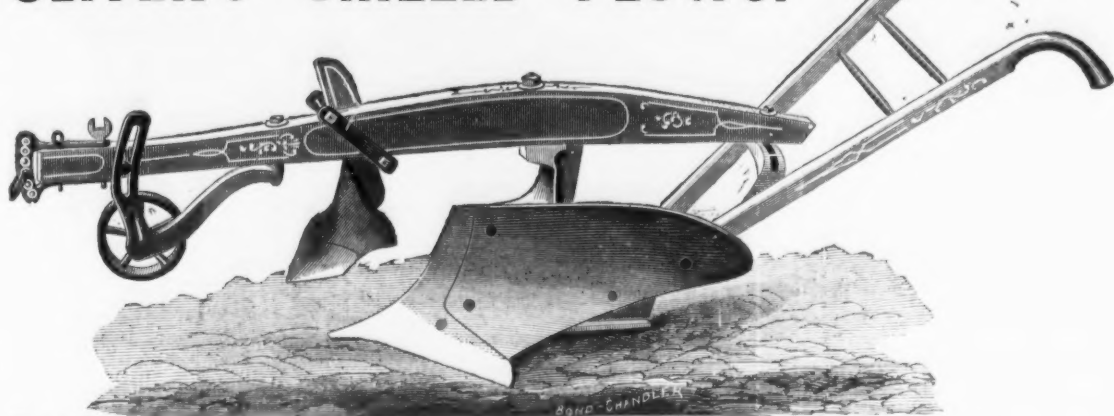
**Locks and Latches.**—  
Door Locks, Rim and Mortise.....dis 35 @ 25 @ 30  
Till and Cupboard.....dis 35 @ 25 @ 30  
American Padlocks.....dis 35 @ 25 @ 30  
Scandinavian Padlocks.....dis 35 @ 25 @ 30  
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# OLIVER'S CHILLED PLOWS.



These implements, though but four years before the public in their present form, show the following remarkable record:  
 1506 were sold in the season of 1871. 7472 were sold in the season of 1873. 31,077 were sold in the season of 1875.  
 3449 1872. 14,976 1874. 42,139 having been sold the past spring.

The sales for 1876, will undoubtedly exceed 60,000 Plows. For full descriptive circulars, address,

**SOUTH BEND IRON WORKS, South Bend, Ind.**

## THE VICTOR PLANES

Are the most simple, compact and practical Adjustable Planes ever offered to the public. They are made under the personal supervision of Mr. L. BAILEY, the original inventor of L. BAILEY'S PATENT ADJUSTABLE IRON PLANES. All our Planes have our Trade Mark. Send for Catalogue, embracing Planes, Try Squares, Bevels, Rules, Levels, Hammers, Mitre Boxes, etc., etc.



# THE SAMSON WRENCH

RECEIVED THE CENTENNIAL MEDAL AND DIPLOMA OF MERIT.



It is the only positive Wrench that will hold Gas or Steam Pipe, Gas Burners, Round Iron or Steel without slipping. Samples sent to the trade only, on receipt of fifty cents and business card.

**W. J. FLANAGIN & CO., Sole Manufacturers,**

Office, 32 North 5th Street, PHILADELPHIA.

# THE BILLINGS & SPENCER CO.,

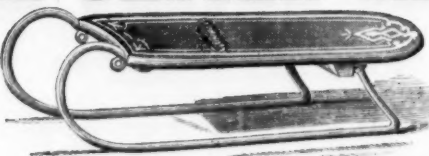
HARTFORD, CONN.

MANUFACTURERS OF

Die Plates and Dies, Genuine Packer Ratchet Drills, Clamp, Die and Common Lathe Dogs, Barwick Wrench and Pipe Tongs, the Billings Patent Sewing Machine Shuttles, Marlin Spikes, Calkers' Tools, Clinch Rings, Saw Sets, Screw Drivers, And all description of IRON AND STEEL Drop Forgings.

Send for a Circular.

# THE ULSTER SLED.



(PATENT APPLIED FOR.)

In presenting to your notice our **ULSTER SLED**, we introduce an article that has long been needed in the trade, viz.: a light, yet strong and durable sled. This has been accomplished, as the entire running gear, runners and cross-bars, are formed by a single piece of metal. The hopes and efforts of the inventors and manufacturers of our country have been directed toward reaching, in this our Centennial year, perfection in their respective productions, and we now leave it to the public and their children to decide whether we have been successful or not. Very truly,

**CROSBY, GILZINGER & CO., Manufacturers, RONDOUT, N. Y.**

# GOLD MEDAL

# Non-Extensible Razor Belt.

PATENTED JULY 25, 1871.

RE-ISSUED MAY 13, 1873, and JUNE 9, 1874.

In this Strap the liability of the leather to stretch and become loose and porous is prevented by the use of a patented non-extensible base, which supports the leather and secures

## PERMANENT ELASTICITY.

We make this style with single rod, double rod, and wood frames, and intend that it shall, in quality compare favorably with our other well known brands.

**BENJAMIN F. BADGER & SON, Manufacturer**

Badger Place, Charlestown, Mass.

# THE "DUCKHAM" PATENT

Suspended Self-Indicating WEIGHING MACHINE.

Capacities from 1 to 100 tons.

This machine is used on a crane or any lifting apparatus, and indicates the weight on the dial directly the article is lifted. It is accurate, requires no adjusting, portable, and the greatest labor-saving weigher ever introduced.

Send for Circular and Price List.

**ROBERT KING,**

MANUFACTURER,

Hydraulic Presses, Accumulators, &c.

246 to 250 Plymouth St., Brooklyn, N. Y.

Office, 110 Wood St., Philadelphia.

Manufactured by

FAIRMOUNT MACHINE WORKS

110 WOOD ST., PHILADELPHIA.

Send for Circular and Price List.

With Patent Applied For.

Power Pulleys in two sizes, 10 and 15 feet in diameter.

Patent Pulleys.

Patent Pulleys.

Patent Pulleys.

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## CINCINNATI.

Reported by Sellers & Co., Importers and Jobbers in Metals, No. 214, 216 and 218 Main street.

Oct. 10, 1876.

Tin Plate.—1. C. 10x14 Charcoal.....	@ \$8.50
2. C. 14x20 Charcoal.....	@ 12.50
3. C. 14x20 Charcoal.....	@ 9.00
4. C. 12x12 Charcoal.....	@ 11.00
5. C. 12x12 Charcoal.....	@ 9.25
6. C. 12x12 Charcoal.....	@ 11.50
7. C. 12x12 Charcoal.....	@ 16.50
8. C. 12x12 Charcoal.....	@ 7.50
9. C. 12x12 Charcoal.....	@ 8.50
10. C. 10x20 Coke.....	@ 13.00
Sheet Zinc.—Cask.....	@ 9.50
Sheet.....	@ 10.00
Copper.—Braziers.....	@ 32.00
Sheathing.....	@ 32.00
Bottoms.....	@ 32.00
Bars.....	@ 22.00
Block Tin.—Fig.....	@ 22.00
Lead.—Fig.....	@ 7.50
Solder.—S. & Co.....	@ 8.50
Market Wire.—Buckner.....	@ 15.00
Sheet Iron.—No. 27.....	@ 4.00
Smooth 27.....	@ 5.00
Smooth 27.....	@ 5.00
Painted "A".....	@ 12.00
Painted "B".....	@ 12.00
Painted "C".....	@ 12.00
Painted "D".....	@ 12.00
Painted "E".....	@ 12.00
Painted "F".....	@ 12.00
Painted "G".....	@ 12.00
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Painted "X".....	@ 12.00
Painted "Y".....	@ 12.00
Painted "Z".....	@ 12.00

## BOSTON.

Reported by Macomber, Bigelow & Dowe, 156 to 164 Oliver St.

Anvils.—"Eagle American".....	per lb. 10c; dis 20%
Angers.—Various Ship.....	dis 10%
1. Roundhead ship.....	dis 40%
2. Blue jacket.....	dis 10%
3. Blue jacket.....	dis 10%
4. Blue jacket.....	dis 10%
5. Blue jacket.....	dis 10%
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49. Blue jacket.....	dis 10%
50. Blue jacket.....	dis 10%

It is the only positive Wrench that will hold Gas or Steam Pipe, Gas Burners, Round Iron or Steel without slipping. Samples sent to the trade only, on receipt of fifty cents and business card.

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Office, 32 North 5th Street, PHILADELPHIA.

Office, 32 North 5th Street, PHILADELPHIA.

Office, 32 North 5th Street, PHILADELPHIA.

## Wire Netting.—Clinton Wire Cloth Co., Green.

Drab or Black.....

Wrenches.—Genuine Wrenches, G. A. Coes, dis 10%

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## THE JUDSON GOVERNOR.

It is a common method to advertise Governors without cost, unless satisfactory to the customer, and then charge High Prices for doing what any good Governor will do. Various Governors inferior to the "Judson" are sold in this way, operating well enough for three months, to insure collection of the pay, but becoming useless after a year's wear—their construction lacking durability. The Judson Governor is guaranteed to be not only the best Governor of Steam Engines, but also the most durable Governor made. Parties in buying other Governors should stipulate that their durability be guaranteed, and should also take care that they do not, for much inferior Governors, pay higher prices than those shown in the accompanying list. We guarantee the Judson Governor will do all any other Governor can do, and in Accuracy and Durability—the main essentials—we guarantee it shall do more.

### Reduced Price List,

JANUARY 25th, 1876.

For dimensions of Governor, see Illustrated Price List.



THE JUDSON PATENT

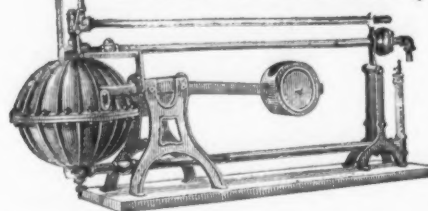
Improved Steam Governor.

No Charge for Boxing & Cartage.

JUNIUS JUDSON & SON, Rochester, N. Y.

Size, Inch.	Plain.	Bright Finish.	Extra for Lever.	Stop Valve.
1 1/2	\$17.00	\$19.00	\$1.00	..
2	21.00	24.00	2.00	\$5.00
2 1/2	25.00	28.00	2.50	6.00
3	29.00	33.00	3.00	8.00
3 1/2	35.00	40.00	3.75	10.00
4	42.00	48.00	4.50	14.00
4 1/2	45.00	51.00	5.00	15.00
5	49.00	56.00	5.75	17.00
5 1/2	55.00	63.00	6.50	20.00
6	64.00	73.00	7.50	25.00
6 1/2	74.00	84.00	8.50	30.00
7	86.00	97.00	10.00	35.00
8	94.00	106.00	11.00	42.00
9	112.00	125.00	13.00	48.00
10	125.00	138.00	15.00	54.00
12	150.00	165.00	18.00	68.00
14	185.00	202.00	22.00	80.00
16	205.00	225.00	25.00	..

## The Albany Steam Trap.



This Trap automatically drains the water of condensation from Heating Coils, and returns the same to the Boiler whether the Coils are above or below the water level in Boiler, thus doing away with pumps and other mechanical devices for such purposes. Apply to

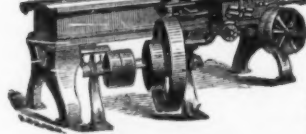
Albany Steam Trap Company, Albany, N. Y.

## The Pratt & Whitney Co.,

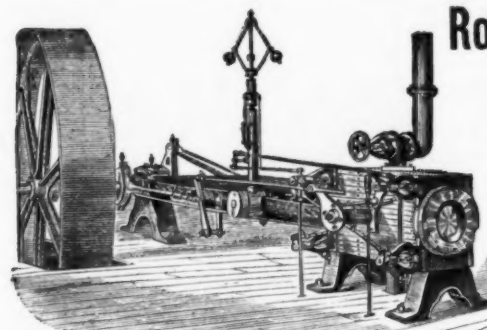
Hartford, Conn.,

Have constantly on hand and making

## Drop Hammers



Of recently improved Construction. Pony Trip Hammers, Blacksmiths' Sheaves, Broaching and Stamping Presses, Iron Shop Cranes, Machinists' Tools, Gun and Sewing Machine Machinery. Make to order Gray and Charcoal Iron Castings of all styles and sizes not exceeding 15 tons weight, (making patterns if desired). Furnish Clamp Pulleys of light patterns, cut gears in a superior manner, &c., &c.



## Robt. Wetherill & Co

CHESTER, PA.

## Corliss Engine

BUILDERS.

Shafting & Gearing,

Boiler Makers.

## THORNE, DeHAVEN & CO., Drilling Machines,

21st Street, above Market, Philadelphia.

PORTABLE DRILLS. Driven by power in any direction. RADIAL DRILLS. Self-feed—Large Adjustable Box Table. VERTICAL DRILLS. Self-feeding. MULTIPLE DRILLS. 2 to 30 Spindles. HORIZONTAL BORING AND DRILLING MACHINES. HAND DRILLS. CAR BOX DRILLS. SPECIAL DRILLS. For Special Work.

## BARKER & STARRETT,

Machinists, Engineers, Pattern and Model Makers.

Small Lathes for Steam or Foot Power. Designs and Drawings for Patent Office. Several Valuable Patents for sale.

1361 Ridge Avenue, PHILADELPHIA, PA. JOHN BARKER, Pattern and Model Department. JAS. STARRETT, Machinery Dep't.

## C. SCOFIELD'S STRAIGHTENER OR BENDER,

For Shafting, Axles, Tubes, Rails, &c.

There has long been a want of some device by which the straightening of shafting could be done without removing the work from the centers, and at the same time do it quickly and accurately. The

### SCOFIELD PATENT SHAFT STRAIGHTENER

meets just such a want; the apparatus is light and can be easily handled, yet it is of sufficient strength for the purpose required. It can be placed upon the shears of the lathe, and moved along the entire length of the work. It is especially

Adapted to Removing Short Bends, which frequently occur in long lengths of shafting. The lightness of the straightener renders it eminently

Adapted for Line and Counter-Shafting, without necessitating the time and trouble of removing hangers and detaching couplings, but can be

Easily applied to the Shaft while in Position.

It can also be used on the bench for short lengths.

For Circulars, Price List, &c., Address,

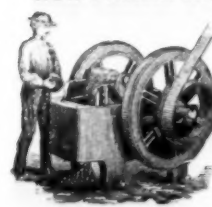
C. SCOFIELD & CO.,

Vineland, N. J.



## BLAKE'S PATENT STONE & ORE BREAKER.

New Pattern with Important Improvements & Abundant Strength



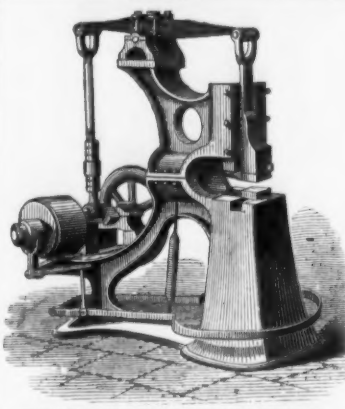
For reducing to fragments all kinds of hard and brittle substances, such as STONE for making the most perfect Macadam Roads, and for making the best CONCRETE. It breaks stone at trifling cost for BALLASTING RAILROADS. It is extensively in use in MINING operations, for crushing

IRON, COPPER, ZINC, SILVER, GOLD, and other ORES.

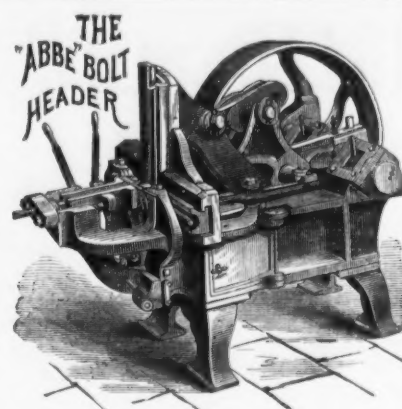
Also for crushing Quartz, Flint, Emery, Corundum, Feldspar, Coal, Barites, Manganese, Phosphate Rock, Plaster, Soapstone, &c.

For Illustrated Circulars, and particulars, address,

BLAKE CRUSHER CO., New Haven, Conn.



THE PALMER POWER SPRING HAMMER.



Of these Machines we are building sizes to meet the requirements of all Manufacturers and Workers of Iron and Steel. In simplicity, durability, ease of operation, accuracy, and range of work, we guarantee them superior to any Machines of their kind produced in the world. For prices, references, and full descriptive circulars, address

S. C. FORSAITH & CO.,

Manchester, N. H.

## Knowles Patent Steam Pumps

MANUFACTURED BY THE

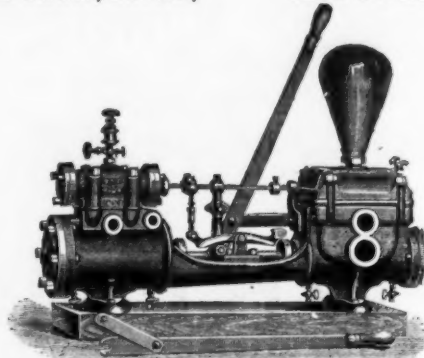
## KNOWLES STEAM PUMP WORKS,

WARREN, MASS.

WAREHOUSES:

14 & 16 Federal Street, Boston,

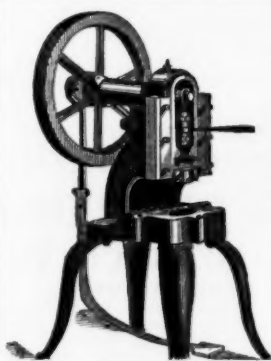
92 & 94 Liberty Street, N. Y.



Cut above represents regular Boiler Feed Pump, No. 3 and 4. Showing New Patent Valve Motion, and Hand Power LEVER Attached and Detached.

### FIRE PUMPS a specialty.

Mining Pumps (both Double Acting Plunger, and Piston Pattern,) which we guarantee to run absolutely noiseless on any lift from 100 to 600 ft., at a single lift, a specialty. Pumps for every possible duty. Prices as low as any, and our workmanship and material altogether the best. Every machine furnished under a complete guarantee.



## A. H. MERRIMAN,

Patent Power

## Punching Presses.

Patentee and Sole Manufacturer.

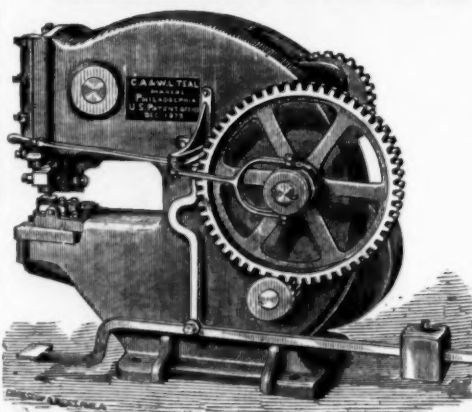
I warrant every part of this Machine to stand the shock of the wheel running at 125 revolutions.

West Meriden, Conn.

Machinery Hall, Philadelphia, Section B 4, Columns 28 and 29.

## C. A. & W. L. TEAL,

Manufacturers of IMPROVED BENDING ROLLS



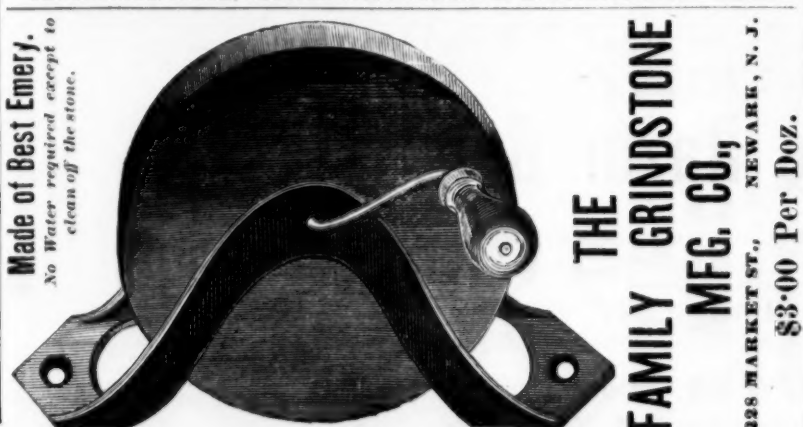
Arranged for Removing Work from the end of top roll.

COMBINED Punching and Shearing Machines, Single Power Punching Machines with Shearing Attachments, Rotary Shearing Machines, Steam Riveting Machines, "Atherton's" Patent "Cam," Steam Engines, Hair Picking Machines and MACHINERY in general.

We would call special attention to the above engine, as it has the same leverage on the driving shaft as every point of the stroke that the "crank" has at its strongest point, making a smoother running as well as a more powerful engine.

4116 Ludlow St., Philadelphia.

CENTENNIAL SPACE, SECTION C. 3, COLUMNS 25 & 26, MACHINERY HALL.



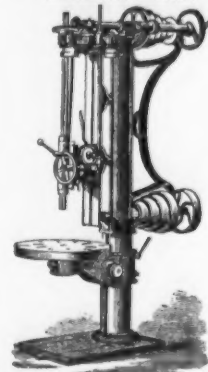
Made of Best Emery. No Water required except to clean off the stone.

THE FAMILY GRINDSTONE MFG. CO., NEWARK, N. J. \$3.00 Per Doz.

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### "BLAISDELL" UPRIGHT DRILLS

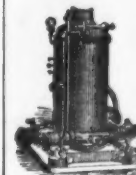
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West Virginia Lubricating Native Rock Oil! Used by most of the Railroads in the United States, Canada and Europe, and by Mechanics on all kinds of Machinery. The Safest, Cheapest and Most Reliable Lubricator in the world. Obtained the Highest Prize at the Paris Exposition. 28, 29, 30 and 31 Gravity. No. 28 CEDAR STREET, NEW YORK.



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SAFEST, CHEAPEST & BEST.

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Engines, Boilers and Steam Pumps.

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Stubs' Tools, Files, Bright Round Steel Wire, Bar & Sheet Steel, &c.

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For Scroll Sawing.

French, German, English & American

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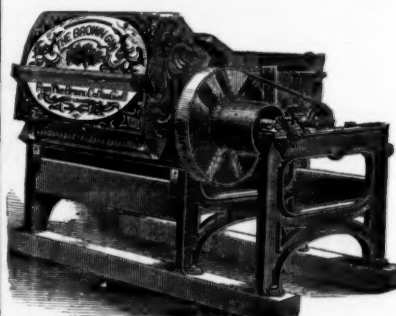
## ALMOND DRILL CHUCK.

## OHL & HAUSCHILD, Engineers & Machinists

And manufacturers of

Lathes, Shapers, Slotters, Planers, Gear Cutters, Drill and Power Presses, Pulleys, Hangers and Shafting, Machinery and Machinists' Tools in general.

57, 59 & 61 Passaic Avenue, Kearney (East Newark), N. J.



## The Brown Cotton Gin Co.

NEW LONDON, CONN.

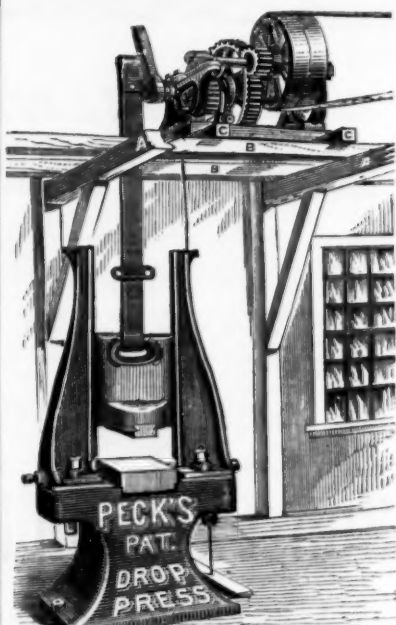
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### COTTON GINS,

With or without

Self-Feeding Attachment & Condenser.

Cotton Gin Saws, Ribs and other Gin materials. Also Albertson's Segment Screw Cotton, and Hay Press. Send for Circular.



I have the largest and best stock of Drop Press Patterns in the country—suitable for Forging, and all kinds of Sheet Metal work.

### WHY THE BEST:

It requires less power, works faster, gives a harder blow with same weight of hammer, the rebound of the hammer is caught without lessening the force of the blow, the blow is uniform and not affected by variations in the speed of the driver. It is always in order. The Drop Press a specialty.

MILO PECK, New Haven Conn.



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THE  
Shapley Engine

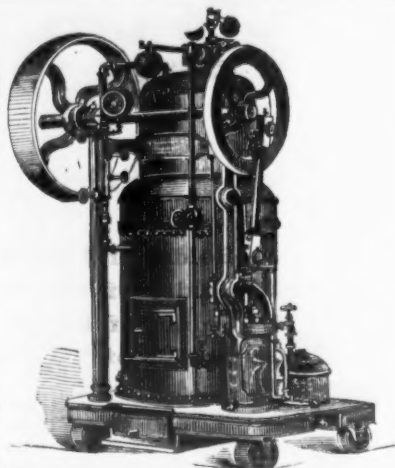
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COMPACT,  
PRACTICAL,  
DURABLE,  
ECONOMICAL.

\$200.00.

Cheaper than any Engine offered of  
the same capacity.

MANUFACTURED BY

SHAPLEY & WELLS,  
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Binghamton, N. Y.Manufacturers of Steam Engines, Boilers, Water Wheels, Circular Saw Mills and  
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(Successor to MATTHEWS &amp; MOORE,)

Engineer, Machinist, Founder and Boilermaker

CASTINGS of every description.

ROLLING MILL AND FURNACE EQUIPMENTS COMPLETE

Rolls Turned for Rails, Beams, Angles, and all shapes for Iron, Steel, or  
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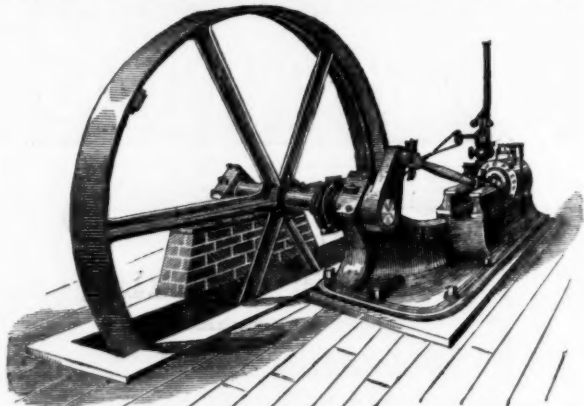
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SPECIAL MACHINERY BUILT TO ORDER.

Vertical and Horizontal Engines, of New and Heavy Designs, from 2 to 100  
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Morse Patent Straight-Lip Increase Twist Drill,  
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Drills for Coes, Worcester, Hunter and other Hand Drill  
Presses, Beach's Patent Self-Centering Chucks, Center  
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All Tools exact to Whitworth Standard Gauges.

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HORSE AND MULE SHOES.

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Established 1848.

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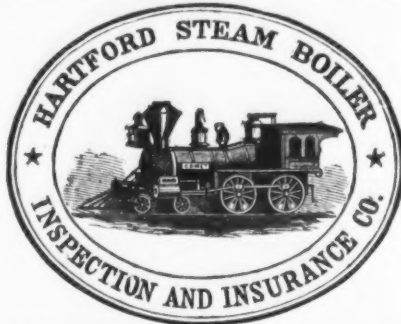
Engineers, Iron Founders and Machinists.

RAILWAY SHOP EQUIPMENTS.

Our Steam Hammers, Lathes, Planers, Drills and Bolt Cutters  
Are of Improved and Patented Construction.Railway Turning and Transfer Tables,  
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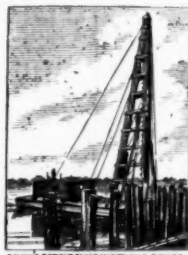
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BUILDERS OF STEAM DREDGING MACHINES,  
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Anti-friction and noiseless; maximum blast and minimum power;  
all sizes for

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ALSO  
KEYSTONE EXHAUST BLOWERS.

Made on same principle.

For Ventilating Mines, Buildings, etc.; Removing Dust,  
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Blower guaranteed. Send for circular, or  
call and see them in operation.

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120 Exchange Place, Philadelphia.

Also, sole manufacturers of the celebrated KEYSTONE PORTA-  
BLE FORGES, for all classes of work, from the lightest to the heaviest.The C. O. D. Engine  
COSTS LESS

And is equal to any Engine in the market.

ALL WORKING PARTS WELL FINISHED.

No. 1, Cylinder 4x6.....\$125.00

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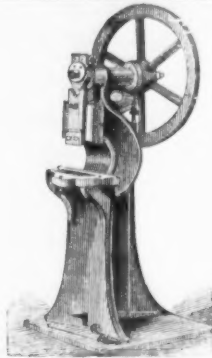
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Wheatcroft's Self-Adjusting Pipe Wrench,

AND  
SCRIPTURE'S FUNNEL TOP OILERS.

## Machinery, &amp;c.



REPORT OF JUDGES

In Department F, Group 3, at the 44th

Exhibition of the

AMERICAN INSTITUTE,

Held in the City of New York, Oct., 1875

No. 318, Drawing, Drop &  
Punching Presses.THE STILES & PARKER PRESS CO.,  
Of Middletown, Conn.The machinery exhibited by these makers is of a  
character that calls for special commendation. In  
addition to their well known punching presses, to  
which a new feature has been added in a press ad-  
justable to an inclination for discharging work left  
above the die, there are exhibited by them a com-  
bined punch and shears, a drawing or blanking press,  
and a drop.In all these there is shown the highest mechanical  
culture, applied to meet every practical requirement,  
to avoid every practical difficulty, and to enlarge the  
range of application of the machines, by devices  
which are at once simple, elegant, and effective.  
Your committee would unhesitatingly recommend  
for this exhibition the Medal of Progress, but  
and such award debarred by the rule of the Institute,  
forbidding such award unless a Silver Medal has  
been previously awarded. We, therefore, respect-  
fully recommend the award of a Silver Medal.

Silver Medal Awarded.

A true copy from the Report on file.

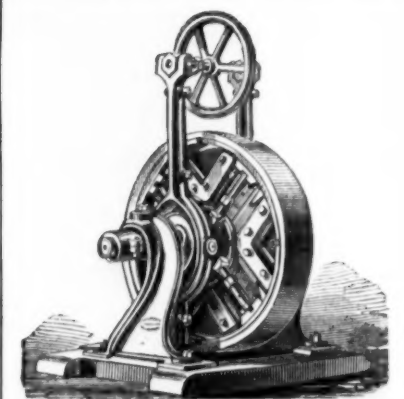
JOHN W. CHAMBERS, Sec'y.

AQUOMETER  
Steam Pump.Highest Premium awarded by  
Franklin Institute, 1874,  
For Simplicity, Economy of  
Construction & Efficiency.An absolutely Durable, Cheap, Efficient and Eco-  
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lubricating. Warranted. Address for circular,AQUOMETER STEAM PUMP CO.,  
10 South Dela. Avenue, Philadelphia,

Send to us for Catalogue.

Valley Machine Co.

## EUREKA SAFETY POWER!

Practically impossible to  
explode. Tested to 30 lbs  
pressure per square inch. Will  
lift 2 inch seasoned oak—grind  
bushels Corn per hour. Price  
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## FRICTION PULLEYS

Friction Clutches

For Connecting Shafting and Gearing.

ELEVATORS.

Lafayette Street, PROVIDENCE, R.



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760 South Broad Street, PHILADELPHIA.  
PAUL S. REEVES,  
MANUFACTURER OF

### ANTI-FRICTION METALS.

XXX Genuine.....	40c	C.....	20c
XX.....	35c	D.....	15c
X.....	30c	E.....	10c
.....	25c	F.....	11c

Note.—The above are my standard mixtures, and have given satisfaction wherever used, but I am prepared to make Anti-Friction Metal of any quality or mixture desired by the purchaser.

BRASS CASTINGS, 21 to 35c. | INGOT BRASS, 19 to 28c. | BRASS TURNINGS AND OLD METALS WANTED.

ESTABLISHED 1842.

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P. O. Address: Frankford, Philad'a. | MANUFACTURERS OF ALL KINDS OF

### Elliptic, Platform AND C Springs,

MADE EXCLUSIVELY FROM

SWEDISH STOCK, OIL-TEMPERED and WARRANTED.

Swedish Tire, Toe, Blister and Spring Steel.

CAST SPRING AND PLOW STEEL.  
CAST SHOVEL, HOE AND MACHINERY STEEL.

OXFORD TOE, SLEIGH, TIRE AND SPRING STEEL.  
BESSEMER SHOVEL AND PLOW STEEL.

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RE-ROLLED NORWAY SHAPES.  
NORWAY NAIL RODS ROLLED AND SLIT FROM SUPERIOR BRANDS.

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MANUFACTURERS OF

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BUTCHERS', HUNTERS', PAINTERS', DRUGGISTS' & HOUSEHOLD KNIVES  
IN ALL STYLES AND VARIETIES.

Highest Centennial Award.

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It is made from one piece of Metal, both blade and handle; therefore is as cheap as the cheapest. There being no corrugations to catch dirt, it is always clean. The handle being half round at the junction of the blade makes it the strongest Shovel ever manufactured, (where all other Shovels fail.)

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IRON CLAD CAN CO.,

Manufacturers of STAMPED WARE, CAN TRIMMINGS, COAL HODS, Etc.  
Send for Price List.

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PLAIN SOLID HANDLE,  
Patented Nov. 3, 1874.

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ENTIRELY ROUND HANDLE, Patented Feb. 22, 1876.

EAST RIVER S. M. MFG. CO., Sole Manufacturers, 206 Water St., N. Y.

### THE "GEM" Stove Shovel

Is now  
Universally Used  
in the United  
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And kept in stock by all  
first-class jobbers in hard-  
ware, tinware and stoves.

The immense demand  
for this very popular arti-  
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manufacturers to infringe

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therefore notify the trade  
that we will prosecute

all infringers,  
whether manufacturers or  
dealers.

Observe our trade-mark  
and buy only the genuine.  
Send for price list.

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### STEEL CASTINGS.

A Substitute for Steel and Wrought Forgings.  
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## Steel Castings

We make Steel Castings true to pattern, sound and strong. Can be worked same as bar steel. Plow-shares, Mold-boards and Land-sides, Anthracite Coal-breaker Teeth, Wheels and Pinions, Dies and Hammer Heads, Engine and Machinery Castings of all descriptions, Railroad Frogs and Crossings. Invaluable for all articles requiring great strength and durability.

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PITTSBURGH STEEL CASTING CO.,  
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Light and Heavy STEEL CASTINGS of superior quality made on short notice, true to pattern, solid, strong and durable, can be readily forged and tempered.

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Plates Rolled 100 inches wide.

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Sligo Stay Bolt Iron, Warranted Unexcelled.

BOILER HEADS & FLUE HOLES  
PLANGED TO ORDER.

Quality our Specialty.



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UNIFORM SPEED

However great or violent may be the change of load, we will warrant any positive uniform speed of engine desired.

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FOR CLOSING DOORS,

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EITHER WAY.

Very Powerful,

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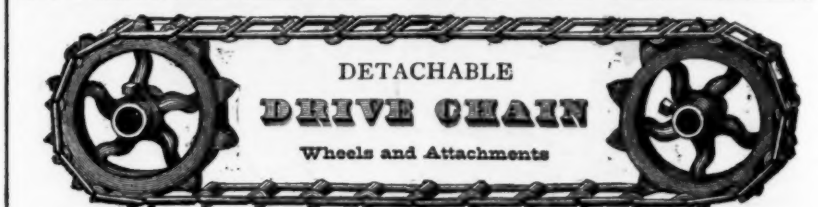
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Indorsed by constant use for years on the best buildings throughout the country.

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Positive transmission. NO Friction. Runs Fast or Slow, Stands Exposure. NO Tension. on all size wheels. Noiseless in service. NO Stretching. Runs Perpendicularly.

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Is a Profitable Substitute for Belting, Shafting, Gears and Ropes.

Adapted to all kinds of Machinery. Finds various uses in Mills, Mines, &c.

Plans for any purpose furnished on application.

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